JPRS 75080
6 February 1980

USSR Report

RESOURCES

No. 917

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 75080	2.	3. Recipient's Accession No.
4. Title and Subtitle USSR REPORT: RESOURCES, No. 917			5. Report Date 6 February 1980 6.
7. Author(s)			8. Perfo/ming Organization Rept. No.
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address As above			13. Type of Report & Period Covered 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This serial report contains information on energy, fuels and related equipment; fishing industry and marine resources; water resources, timber, and electric power and power equipment.

17. Document Analysis a. Descriptors

USSR
Natural Resources
Electric Power
Energy
Energy Conservation
Fisheries
Fuels
Timber
Forestry
Water Supply
Economics

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 2C, 2F, 5C, 10, 21D

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Unlimited Availability Sold by NTIS Springfield, Virginia 22161	UNCLASSIFIED	92
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-7
(Formerly NTIS-35)
Department of Commerce

JPRS 75080

6 February 1980

USSR REPORT

RESOURCES

No. 917

CONTENTS

CONTENTS (Continued) Page

ELECTRIC POWER AND POWER EQUIPMENT

MINISTRIES CRITICIZED FOR SLOW PROGRESS ON GEOTHERMAL ENERGY

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 20 Dec 79 p 4

[Article by M. Solov'yenko, contributor to the newspaper KAMCHATSKIY KOMSOMOLETS: "Geothermal Energy"]

[Summary] A specialized field administration for the use of the earth's heat has been created on the Kamchatka peninsula, and the Institute of Volcanology has acquired a department of geothermal science and geochemistry. Preliminary work is under way on the largest geothermal electric power plant, which is to be built on the Mutnovskoye Bed. The plant's first phase, with a capacity of 200,000 kilowatts, should go into service in a few years.

At the same time, successes with efforts to harness geothermal energy are modest. For example, while the Pauzhetskaya Geothermal Heat and Electric Power Plant has a rated capacity of 5 megawatts, the plant is producing only 3.5 megawatts. The reason for the slow progress is that the USSR Ministry of Geology is not providing the necessary equipment for prospecting work at thermal beds. Therefore this work takes three times as long as it should to complete (up to 15 years).

Another problem is the lack of roads for transporting the equipment. Prospective clients such as the USSR Ministry of Power Production and Electrification have been slow to study the feasibility of utilizing geothermal energy. There is a need for a research and production institution that would develop plans for using this energy as a source of heat.

CSO: 1822

ENERGY CONSERVATION

UDC 622.76.330.13

DISCUSSION OF GAS CONSUMPTION IN THE USSR

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 2-4

[Article by A. S. Voytenko, chief of the State Gas Inspectorate of the USSR: "Gas Consumption--Responsibility and Discipline"]

[Text] Analysis of the checks of the status of gas utilization in industry and agriculture, carried out by Gosgaznadzor [State Gas Inspectorate] of the USSR shows that the ministries and agencies are not always manifesting the proper requirements on the managers of subordinate enterprises and organizations in problems of realizing available fuel-saving reserves.

More than 21,000 industrial enterprises of the country are now utilizing natural gas for production and energy needs. In 1978 alone, they consumed more than 320 billion m^3 of gas and consumption of it is increasing continuously.

The bodies of Gosgaznadzor of the USSR systematically conduct checks of the status of gas utilization by enterprises, the purpose of which is to contribute universally to efficient use of natural gas.

A check of 28,500 units of gas-using installations and equipment of 2,500 enterprises of various ministries and agencies with total gas-consumption volume of 31.4 billion m^3/year was made in 1978. It was established in this case that unjustified overconsumption of gas in the volume of 440 million m^3 was permitted in only 2,500 gas-using installations of 1,230 enterprises investigated with heat-engineering monitoring devices. These include 60.5 million m^3 by enterprises of Minneftekhimprom [Ministry of the Petrochemical Industry] of the USSR, 27.7 million m^3 by enterprises of Mintyazhmash [Ministry of Heavy and Transport Machine Building], 19.8 million m^3 by enterprises of Minkhimmash [Ministry of Chemical and Petroleum Machine Building], 48 million m^3 by enterprises of Minavtoprom [Ministry of the Automotive Industry], 11.9 million m^3 by enterprises of Minstroydormash [Ministry of Construction, Road and Municipal Machine Building], 51 million m^3 by enterprises of Minlesprom [Ministry of the

Timber and Wood Processing Industry], 19.8 million m^3 by enterprises of Minbumprom [Ministry of the Pulp and Paper Industry] and 95.4 million m^3 by boiler plants of the ministries of housing and municipal services of the union republics.

Inefficient use of gas at enterprises is explained by many factors. Thus, gas-saving measures have not been worked out at 600 enterprises, installations have not been equipped with heat recovery devices at 560 enterprises and recovery devices have been installed at 80 enterprises, but do not operate. Regime-adjustment operations on gas-using equipment were not carried out at half the investigated enterprises and gas analyzers to monitor combustion products were not installed. One-third of the enterprises has no automatic control of the combustion process, there are no confirmed specific gas consumption norms at many enterprises and these norms do not correspond to the specifications of established equipment at some enterprises.

Analysis of the checks made by bodies of Gosgaznadzor of the USSR permits one to conclude that the ministries and agencies are not placing the proper exactingness on the managers of subordinate enterprises and organizations and are poorly conducting work to economize on natural gas. At the same time, approximately 1 billion m^3 of gas can be saved annually as a result of implementing the measures prescribed by bodies of Gosgaznadzor of the USSR at enterprises inspected in 1978.

The main sources for economizing on fuel gas at the enterprises of all ministries and agencies are improvement of the structure and economy of thermal and electrical energy production by using more efficient equipment, dismantling of physically and morally obsolescent gas-using equipment, modernization and reconstruction, bringing the technical-economic indicators of equipment operation up to the design standards and further reduction of specific gas consumption per unit of produced energy or product.

One of the most important trends in fuel economy is also maximum possible use of secondary energy resources formed in many plants, i. e., fuel wastes of some plants, and also heat, water, steam or discharge gases which can be used successfully for hot water supply, heat supply and heating residential buildings, production buildings and greenhouses.

One of the significant causes of inadequately efficient use of gas, including secondary energy resources, is a shortage of modern gas-using equipment, burner devices, fuel metering devices and heat recovery devices. Because of the absence of the required number of devices for accounting for gas and thermal energy consumption, monitoring of their consumption is carried out for the greater part only throughout the enterprise as a whole and is not organized by individual intraplant users, and in some cases general plant accounting is not even carried out.

Fuel consumption largely depends on the designs of gas burner devices. But centralized burner production has not been adequately organized and these burners must frequently be manufactured by the semi-handcrafted method.

The need of most sectors of industry for equipment required for more efficient use of energy resources is being incompletely satisfied from year to year.

It was established during the check that a significant part of enterprises are violating fuel and gas-consumption conditions and are using gas without placing any limits on this. Thus, approximately 500 of 2,500 enterprises checked in 1978 permitted overconsumption of gas, 160 consumed gas without having stocks and the volume of consumption comprised more than 215 million m^3 for all of them. Some enterprises, having seasonal gas-selection conditions, use it year round. The volume of gas consumption by 80 enterprises exceeded by 605 million m^3 the volume established by authorization of Gosplan of the USSR for gas use.

More than 450 enterprises have no reserve fuel facilities provided by fuel conditions.

As an example, one should dwell on the state of gas use in some of the main gas-consuming regions of the country.

Moscow and Moskovskaya Oblast are two of the largest industrial centers in natural gas use. Approximately 29 billion m^3 of gas was consumed by enterprises of the capital and oblast in 1978.

Many examples of really efficient use of gas were noted during the checks. Thus, the fuel saving during the first six months of 1979 comprised 900 and 108 tons of comparison fuel at the Moscow Plant Serp i Molot of Minchermet [Ministry of Ferrous Metallurgy] of the USSR and the Moscow Automobile Plant imeni Leninskiy Komsomol of Minavtoprom.

However, there are enterprises where the fuel economy reserves are far from exhausted. A check of 186 enterprises, conducted during the first six months of 1979 by the Moscow Territorial Inspectorate of Gosgaznadzor of the USSR, showed that a gas saving of approximately 30 million m^3/year can be achieved at these enterprises alone if the deficiencies noted by the inspectorate are corrected.

Matters are especially unfavorable with the use of gas at enterprises of the construction materials industry. Overconsumption of it during the past year comprised 400,000 and 450,000 m^3, respectively, at reinforced concrete products plants number 6 and 17 of Glavmospromstroymaterialov [Main Administration of the Building Materials and Structural Parts Industry of the Mosgorispolkom] (Moscow), 610,000 m^3 at the Reinforced Concrete Products Plant at Domodedovo and 1.5 million m^3 at the combine of production enterprises of Glavmosoblstroy [Main Administration for Construction in Moscow Oblast] (Elektrostal').

It should be noted that persistent work directed toward improving the use of gas by enterprises is being carried out in Moscow and Moskovskaya

Oblast. As a result, gas consumption in Moscow and the oblast was below the planned level in 1978. This was achieved by timely implementation of organizational and technical measures by most enterprises on preparation toward the fall-winter season. However, checks made by the State Gas Inspectorate of the USSR showed that there were still significant deficiencies in preparation toward the past winter.

The enterprises of Moscow and Moskovskaya Oblast are now preparing for winter at full speed. Part of the industrial enterprises will be converted to reserve fuel to ensure uninterrupted supply of industry and municipal services with natural gas during the coldest season of the year. Therefore, special attention is being devoted to the presence of reserve fuel facilities at them. It should be noted in this case that Minlegprom [Ministry of Light Industry] of the USSR, Minstroymaterialov [Ministry of the Construction Materials Industry] of the USSR, Minmyasomolprom [Ministry of the Meat and Dairy Industry] of the USSR and Minsel'khoz [Ministry of Agriculture] of the USSR are not devoting the proper attention to construction and timely introduction of reserve fuel facilities. Their construction is being postponed from year to year at the cement plants of Minstroymaterialov of the USSR at Shcherovo Village and Podol'sk, in the greenhouses of the Kolkhoz imeni Gor'ky of Minsel'khoz of the USSR (Leninskiy rayon of Moskovskaya Oblast). The Moscow Print Works (Minlegprom of the USSR) has only an emergency instead of a reserve fuel supply. The Ministry of Tractor and Agricultural Machine Building has not yet been allocated funds for fuel oil for the boiler plant of NIItraktorsel'khozmash [Scientific Research Institute of Tractor and Agricultural Machinery-Manufacturing Technology] (Ivanteyevka); therefore, the equipment cannot operate on reserve fuel.

With regard to filling their tanks with reserve fuel, the main part of the enterprises of Moscow and Moskovskaya Oblast are solving this problem successfully.

Another large gas consumer is Kiev and Kievskaya Oblast. Approximately 5 billion m^3 of natural gas are consumed for fuel needs here, and, unfortunately, there are cases of inefficient use of it. Thus, inefficient gas consumption at the rate of 18 million m^3 was permitted last year at subordinate enterprises of Minlesprom of the Ukrainian SSR and approximately 27 million m^3 of gas were inefficiently burned in the boiler plants of Minzhilkommunkhoz [expansion unknown] of the Ukrainian SSR.

Eighty-one of 448 enterprises of the Ukraine included in the winter restriction list in 1978 were not prepared to release gas, including 18 in Minstroymaterialov of the USSR, three in Minlegprom of the USSR, eight in Minchermet of the USSR and five each in Minenergo [Ministry of Power and Electrification] of the USSR and Minpishcheprom [Ministry of the Food Industry] of the USSR.

It should be emphasized that the Kiev gorispolkom very poorly monitors the construction of reserve fuel facilities. Thus, the regional boiler plants

Nikol'skaya-Borshchagovka and Vinogradar' were put into operation without reserve fuel depots in violation of the fuel conditions stipulated by Gosplan of the USSR and the boiler plant of the Voskresensk Tract is also being prepared for startup without reserve fuel.

Enterprises subordinate to the Kiev gorispolkom are constructing reserve fuel facilities and are releasing gas very poorly. Examples of this are the decorative garden Troyanda, the Bortnichev Aeration Station and the Tereski Flower Culture Facility. The reserve fuel depot of the reinforced concrete products plant No. 5, which released 200,000 m^3 of gas per day during severe cold spells, has been disassembled by order of the gorispolkom with regard to reconstruction of the boiler plant.

The enterprises of Kiev are also poorly prepared for the coming winter season. Thus, only 11,200 tons with a total capacity of 37,700 tons of reserve fuel had been supplied by the end of June, while the stocks allocated for the third quarter [illegible]prise 14,000 tons.

There are absolutely no stocks for fuel oil at enterprises of the Furnitura Association (Minlegprom of the USSR), NIIzemledeliye [expansion unknown] (Southern Division of VASKhNIL [All-Union Agricultural Academy imeni Lenin]) and others. Many enterprises of Kiev constantly overconsume gas. They include the Plant Bol'shevik, whose furnace facilities are at the lowest technical level and the Plant Krasyy Ekskavator of Minstroydormash. On the whole the city is overconsuming more than one million m^3 of gas per day during periods of restrictions.

The faulty practice of Gosplan of the Ukrainian SSR not to provide the sovkhozes of Minsovkhoz of the Ukrainian SSR with adequate limits for gas should be noted. During only five months of this year, the sovkhozes of Kievskaya Oblast alone overconsumed 12 million m^3 of gas.

Matters with gas consumption are also not favorable everywhere in the Oblast. Thus, the Tripol'sk Silicate Plant is being prepared for startup without reserve facilities and the Knitted Linens Plant (Minlegprom of the USSR) at Gorlovka, the Plant imeni Artem (Minstroymaterialov of the USSR) and the Cement-Slate Combine (Minstroymaterialov of the USSR) at Kramatorsk have no reserve fuel facilities and are constantly overconsuming gas.

The overconsumption of fuel during 1978 at the blast-furnace plants of Minchermet of the USSR should be noted. Thus, the overconsumption was more than 100,000 tons of comparison fuel at the Plant imeni Il'ich (Zhdanov) and more than 60,000 tons of comparison fuel at the Azovstal' Plant. At the same time time overconsumption of allocated gas stocks was expressed at 1.329 billion and 133 million m^3, respectively. Secondary fuel after the heating furnace of rolling mill 280 and four open-hearth furnaces at the Metallurgical Plant imeni Kuybyshev (Kramatorsk) is not being utilized. The saving at this plant could be 50,000 tons of comparison fuel annually.

Natural gas is also being used inefficiently in Zhitomirskaya Oblast. Thus, a boiler plant of MZhKKh [expansion unknown] of the Ukrainian SSR with PTVM-50 boilers not adapted to burn fuel oil is being constructed at Zhitomir, whereas the gas shortage throughout the city comprises 300,000 m^3/day during cold spells. The Khimvolokno Plant (Zhitomir) overconsumed 428,000 m^3 of gas during the year. A reserve of only 4,500 tons has now been created for all of Zhitomir with the presence of a reserve fuel capacity of 27,000 tons. A fuel oil reserve has absolutely not been created at the plants Avtozapchast' (Minavtoprom) and the paper mill (Minbumprom), the sugar refinery (Minpishcheprom of the USSR), the Assembled Steel Sections Plant (Minstroymaterialov of the USSR) and others have no stocks.

There are many examples of unsatisfactory use of gas throughout Voroshilovgradskaya and Donetskaya Oblasts.

The gas supply situation was tight in some oblasts last winter during the sharp cold spells. The difficulties were largely explained by the absence of reserve fuels facilities, for example, at some enterprises of Minstroymaterialov of the USSR, by allocation of stocks in insufficient volume (specifically, by the Cherepovets Metallurgical Plant by Minchermet of the USSR), inefficient use of gas at the motor plant of Minavtoprom (Yaroslavl') and others.

The available facts of inefficient use of natural gas indicate that not all the managers of enterprises of some ministries and agencies are yet devoting proper attention to problems of efficient use of gas and are permitting significant unproductive consumption of it.

It was also established by investigations conducted by bodies of the State Gas Inspectorate of the USSR that many enterprises have unsatisfactorily solved problems of preparation for the fall-winter season of 1979/1980, they have delayed introduction of reserve fuel facilities into operation and they have not provided for supplementation of them with reserve types of fuels where these facilities exist.

Preparation for operation under winter conditions is an important state task. The coldest season of the year is always a check of our readiness for winter and a check of the quality of work to introduce measures which provide economical consumption of energy resources.

The ministries and agencies, the councils of ministers of the union republics, party and Soviet bodies and managers of economic organizations and enterprises should regard problems of rational and efficient use of gas as the most important and primary types.

6521
CSO: 1822

ENERGY CONSERVATION

UDC 622.76.330.13

IMPROVING GAS UTILIZATION TECHNOLOGY

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 5-7

[Article by G. I. Ibragimov, Moscow Territorial Office of State Gas Inspectorate of the USSR]

[Text] Uninterrupted supply of enterprises with high-quality fuel should be solved not only by increasing gas production and transport but also by more efficient use of it, searching out reserves for saving and more efficient use of energy resources.

It is planned to achieve more than one-third of the total saving of boiler-furnace fuel at industrial enterprises during the 10th Five-Year Plan as a result of introducing new and increasing the economy of existing equipment, improvement and intensification of production and also introduction of energy production processes with a simultaneous increase of the unit capacity of equipment, improvement of gas-burner devices, further automation of production and the use of secondary energy resources.

Investigations of industrial enterprises carried out by the Moscow Territorial Office (MTI) of Gosgaznadzor [State Gas Inspectorate] show that extensive work is being carried out in this direction at many plants and factories. It is very indicative that problems of gas economy are being solved successfully at enterprises well-equipped technologically with high production skills and improved product output technology. An example may be the plants Serp i Molot and Krasnyy Bogatyr'. Measures on efficient use of energy resources are being developed here systematically and their fulfillment is being monitored constantly. Much attention is devoted to introduction of progressive production equipment and mechanization and automation of production processes. As a result a high level of natural gas use has been achieved.

Unfortunately, the managers of some enterprises are using natural gas wastefully and are far from totally using available reserves of energy resources.

There are also enterprises and organizations which permit overconsumption of natural gas and which do not fully utilize secondary heat sources.

In 1977, MTI of Gosgaznadzor investigated 443 industrial enterprises of Moscow and Moskovskaya Oblast. The following deficiences in the use of gas, which encompass the number of enterprises presented below, were revealed as a result: 51 have no heat recovery devices or they do not operate in the boilers, 278 are not conducting regime-adjusting operations in the boilers or the boilers are being operated with violation of regime schedules, 294 do not monitor the quality of gas combustion or gas analyzers do not operate, 213 have no automatic regulation of gas combustion or the automatic equipment does not operate, 58 have obsolescent, uneconomical boiler units operating, 144 have no technically justified specific fuel consumption standards per unit of product output and 79 have not developed measures for gas economy.

The given data indicate the presence of enormous unutilized reserves of energy resources, which leads to extensive overconsumption of fuel (gas). Thus, the absence or inoperation of heat recovery devices (at 51 enterprises) leads to significant heat losses with waste combustion products (the temperature of the waste gases reaches 300°C, which causes overconsumption of up to eight percent of fuel and a decrease of boiler efficiency by 4-6 percent. Failure to utilize automatic regulation of gas combustion (213 enterprises) leads to losses (overconsumption) of up to three per cent of fuel. No lesser loss is inflicted by unmonitored gas combustion caused by the absence or inoperation of gas analyzers; violation of the regime schedules of boiler operation leads to overconsumption of gas up to five per cent of the annual volume of consumption and up to 20 per cent of the fuel is lost when using boilers of obsolescent design and so on.

Analysis of the given deficiencies revealed the factors that caused them. Some of them are presented below.

Failure to use secondary energy resources was caused by the fact that heat recovery devices of combustion productions were not installed on boilers--the result of the fact that they were not provided by the gasification designs of boiler plants; recovery devices were installed, but they do not operate--they were switched off without reasonable cause (or they failed and there was no opportunity to replace them since funds are essentially not allocated for them).

The reasons for failure to utilize automatic regulation of combustion in boilers is the absence of automatic regulation equipment--this is usually the result of the fact that it was not provided by the gasification designs of boiler rooms; the automatic equipment was installed but does not operate due to neglect by the managers and maintenance personnel, low qualifications of maintenance personnel in the boiler room and the absence of a KIP i A [Monitoring and measuring instruments and automation equipment] service.

The absence of monitoring the quality of gas combustion in boilers is caused by a number of factors: introduction of gas analysis and consequently the presence of portable gas analyzers, which cannot always be acquired, was not provided in the designs of boiler units and, moreover, orders for them were frequently not compiled by enterprises managers in time. The available gas analyzers are frequently not used due to the absence of specially trained personnel.

Gas-using equipment is operated without regime-adjusting operations mainly through the fault of industrial enterprises who do not conclude agreements on time with the adjusting organizations.

The absence of technically justified specific fuel consumption norms in boiler rooms is caused by low quality of heat engineering testing of boilers and without working out specific norms and also by the absence of devices for taking into account thermal energy consumption in boiler rooms and by the absence of shop accounting for gas consumption.

Operation of uneconomical boiler units occurs mainly with regard to the fact that the managers of enterprises do not present applications on time for design and acquisition of more improved boiler units and in some cases due to the absence of areas for reconstruction of the boiler plant. The use of imperfect gas-burner devices (GGU) occurs due to the absence of data at the enterprises on the results of state trials of GGU (on rejected GGU), recommendations on installation of burners for specific types of boilers and also lack of support of enterprises with improved GGU.

The VNIIpromgaz Institute [All-Union Scientific Research Institute of Gas Utilization in the National Economy and of Underground Storage of Petroleum, Petroleum Products and Liquified Gas] established that the following burners are most suited for DKVR boilers by specifications: GMG-1.5 or IGK-250 for the DKVR-2.5/13, GMG-2 or IGK-250 for the DKVR-4/13, GMG-4M or IGK-250 for DKVR-6.5/13/6.5/23, GMGB-5.6, GMG-7M or GA-110 for DKVR-10/13/-10/23, GMG-7M or GA-110 for DKVR-20/13/20/23 and GMG-10, GMG-7M or GA-110 for DKVR-35/13. Incorrectly selected gas burners contribute to overconsumption of gas and lead to failure of the boiler.

Elimination of the noted deficiencies permits one to save approximately 47 million m^3 of gas annually.

The absence of proper monitoring on the part of superior organizations of observance of economizing conditions and planning of specific fuel consumption norms leads to unjustified increase of them compared to normative levels. There are cases when agencies confirm specific norms for their enterprises which do not correspond to the level of the gas-using equipment and which exceed the specific consumption actually achieved.

Cases of wasteful use of gas and violations of gas-consumption discipline determined by inspection at industrial enterprises were regularly

considered by Committees of People's Control and at meetings of the Ispolkom of the Mossovet [Moscow City Council]. But, unfortunately, the results of the checks and the decisions adopted from them have not had their effect on the managers of some enterprises.

The Moscow Territorial Office of Gosgaznadzor made a check in 1977 of fulfillment of previously issued stipulations to increase gas utilization efficiency at 155 industrial enterprises of Moscow and Moskovskaya Oblast. It was established in this case that unnecessary measures were adopted at many enterprises to improve gas utilization and that the stipulations of the Office were not being fulfilled on a timely basis. At the same time a second check showed that a significant part of the managers of the investigated industrial enterprises is not devoting the proper attention to problems of increasing the efficiency of use of fuel and energy resources.

The unsatisfactory state of using fuel and energy resources at industrial enterprises is usually explained by untimely support of subordinate enterprises with modern gas-using equipment, recovery devices, automatic combustion equipment and gas and thermal energy metering devices by superior organizations and a significant part of recovery devices, sets of automatic equipment and gas analyzers of combustion products already installed are not operating.

Rhythmic and stable gas supply of any city is impossible without adhering to strict gas consumption discipline. Adherence to gas consumption discipline is of especially important significance under conditions of a constant increase of gas consumption and the remoteness of gas users from gas supply sources.

The main trends for increasing the efficiency of natural gas use at industrial enterprises and organizations are:

development and implementation of measures to increase the efficiency of gas utilization and economy of it;

systematic training of workers who service gas-using equipment.

Centralized and specialized production of gas-using production equipment for different sectors of industry, heat-exchange equipment, new insulating materials, means of monitoring automatic equipment, gas metering devices and also centralized supply of gas-using equipment with the necessary instruments, devices, fittings and automatic equipment must be organized in the country to increase gas utilization efficiency.

One of the methods of increasing the gas utilization efficiency may be introduction of schemes for complex use of the heat from gas combustion products of gas-using equipment at industrial enterprises.

Complex use of heat is directed toward production and energy optimization of heat engineering production processes and is the combination of

production and energy heat utilization which permits an increase of the energy and total economic effectiveness of production and which provides an increase in the productivity of units, a reduction of product cost, uninterrupted production process and also environmental protection by reducing the content of harmful substances in combustion products.

With multiple use of heat, gas combustion products may be sequentially directed to a number of heating installations: to medium- and low-temperature furnaces and boilers, dryers and other production installations, to generate steam, to heat air and water and for cooling.

Schemes for multiple use of the heat of combustion products have been implemented at several enterprises of Moscow.

Thus, for example, a scheme for sequential use of gas combustion products from DKV-2/8 boilers in high- and low-temperature dryers is being introduced at the Second Moscow Automotive Repair Plant (VARZ) of Glavavtotrans.

According to the indicated scheme, the waste gases from boilers enter high- and low-temperature dryers through a flue 500 mm in diameter. The flue gases penetrate the dryers through slits located along the entire length of the pipeline. The waste gases enter the smokestack from the low-temperature dryers through a collector 550 mm in diameter.

The gas saving from introduction of the given scheme comprises 130,000 m^3 annually and the electric power saving is 70,000·kW hr. The payback period is approximately 0.4 year.

A design of an installation for multiple use of the heat from natural gas combustion products of the foundry by the scheme: furnace--first water-heating stage--recuperator--second water-heating stage, has been developed at the Trolley Depot imeni Apakov.

Introduction of this scheme will make it possible to increase furnace efficiency from 10 to 60 percent.

A similar scheme has been operating for five years at the Moscow Experimental-Machine Plant of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] of the USSR. The annual saving comprised 13,500 rubles and the gas saving was 15 m^3/hr. The payback period of the installation is three months.

A scheme for multiple use of the heat of waste gases from two DKV-4/13 boilers in dryers and a contact economizer for heating water used for production needs is being introduced at the Production Association Kauchuk. The water is heated to 55°C in the contact economizer.

The gas saving from introduction of the indicated scheme will comprise approximately 150,000 m^3 of gas annually.

An installation for multiple use of hardening-tempering furnaces of the thermal section using coil water heaters for heating water in the production and service shops has been introduced at the Moscow Automotive Plant imeni Leninskiy Komsomol. Introduction of the installation will permit a saving of up to 1.3 million m^3 annually. The payback period is approximately six months.

One of the methods of increasing the efficiency of gas utilization in machine building is delivery of combustion products to the hardening furnace, diluted by air, to the burners of the tempering furnace.

By diluting the air, the combustion products of the tempering furnace can increase the oxygen content in them up to 13 percent and in this case the temperature of the combustion products can be reduced to 400°C; the gas saving will comprise approximately 20 percent. Further use of the heat of exhaust gases of the hardening furnace in a contact water heater is also possible for production of hot water for production purposes (washing products after hardening in an oil bath). In this case the heat utilization factor of the hardening furnace is increased to 90 percent. The natural gas saving will comprise approximately 360,000 m^3 annually.

Schemes for multiple use of the heat of exhaust gases of combustion products have been worked out by the Department of Natural Gas and Fuel Oil Use of the Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin (MINKh i GP).

Managers of many Moscow enterprises, knowing the feasibility of multiple use of natural gas combustion products, are concluding that it is necessary to conduct technical and economic calculations of re-equipping these installations. The practice of operating the existing schemes shows a significant (by 30-45 percent) increase of the fuel utilization factor. The payback period of expenditures for reconstruction does not usually exceed one year, whereas analysis of operation of the installations by the new technique indicates high economic effectiveness of the method.

The problem of multiple use of the heat from gas combustion products is more extensive and concerns both all existing enterprises having similar installations and those under construction.

The multiple scheme should also be considered in reconstruction and construction of plants, shops and sections, recruiting scientific research institutes for this purpose.

There are great opportunities to increase gas utilization efficiency. Industrial enterprises and planning organizations should primarily establish business contacts with the VNPO Soyuzpromgaz, which is the head organization in problems of gas utilization and which is the testing center of gas-burning devices, with the corresponding departments of MINKh i GP and also with qualified adjusting organizations.

6521
CSO: 1822

DECISIONS OF THE BOARD OF THE MINISTRY OF THE GAS INDUSTRY

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 p 7

[Article: "With the Board of the Ministry of the Gas Industry"]

[Text] The board of the Ministry of the Gas Industry considered at its meeting the problem of preparation of enterprises of the gas industry for operation under the winter conditions of 1979/1980.

The board noted that a significant volume of work has been carried out by enterprises of the sector on preparation for operation under winter conditions, whereas some associations have permitted a lag in fulfilling the planned measures.

The board has obligated the managers of the All-Union industrial and production associations, enterprises and organizations, for purposes of timely completion of preparation of enterprises of the gas industry for operation during the fall-winter season of 1979/1980:

to complete within the shortest deadlines preparation of production, refining, transport and underground gas storage objects, transport facilities and emergency equipment and of all gas facilities for reliable and trouble-free operation during the fall-winter season of 1979/1980 with regard to the experience of the past winter;

to adopt measures for strict observance of rules of technical operation and for increasing production discipline;

to provide the readiness of residential settlements and the production buildings of municipal-service objects foroperation under winter conditions.

to direct organizational-mass and political work jointly with party, trade-union and Komsomol organizations on further mobilization of all labor collectives toward solution of crucial problems for uninterrupted and dependable gas supply of the national economy during the fall-winter season of 1979/1980 and to ensure fulfillment and overfulfillment of the 1979 tasks by all quantitative and qualitative indicators.

6521
CSO: 1822

EFFICIENT, ECONOMICAL USE OF GAS URGED

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 p 1

[Article: "Universal Monitoring of Fuel Economy"]

> [Text] "The country's needs for energy and raw material are increasing continuously and production of them is becoming more and more expensive. Consequently, in order to avoid an extreme increase of capital investments, more efficient use of resources must be achieved, including that by reducing the material consumption of products, the use of less expensive and more efficient materials and also economical consumption of them." (L. I. Brezhnev).

The Northern and West Siberian gas fields, which determine the increasing role of gas in the fuel-energy balance, are being developed at a considerable distance from the main gas consumption centers and require large expenditures both for production and for delivery of this fuel to the central and western regions of the country.

In this regard problems of efficient and economical consumption of gas take on special significance to the national economy.

The acute need to establish conditions for economical fuel consumption in the national economy is clearly determined in the decree of the CPSU Central Committee and the USSR Council of Ministers "On improving planning and intensification of the effect of the economic mechanism to increase production efficiency and work quality."

Development of fuel-saving programs is provided among the primary tasks for the near future.

Functions to carry out systematic monitoring of efficient and effective consumption of gas as a fuel for industry, of observance of a unified procedure for delivery of natural gas to consumers, the technical level of gas-using equipment and devices, introduction of new technology in the field of gas fuel utilization and observance of the established gas

consumption conditions have been entrusted to Mingazprom [Ministry of the Gas Industry] and its main inspection body in the field of energy resource utilization--the State Gas Inspectorate of the USSR.

The reader will become familiar with the results of an extensive check of the enterprises of some sectors of the national economy on the use of natural gas as the main type of fuel in the section which opens this issue of the journal.

The tasks posed in the articles by the chief of Gosgaznadzor [State Gas Inspectorate] of the USSR A. S. Voytenko and by the chief of the Moscow Territorial Inspectorate G. I. Ibragimov will undoubtedly attract the attention of managers of gas-consuming sectors and primarily those whose enterprises are not coping with economical fuel consumption.

The editorial board of the journal is also convinced of the fact that extensive discussion of problems of efficient and economical gas consumption on the pages of the leading organs of the press of these sectors will contribute to intensification of gas-consumption discipline and an increase in the technical level of gas-using equipment.

6521
CSO: 1822

UDC 622.86:658.382:622.33(47+57)

NIKITIN DISCUSSES MINE CONDITIONS, SAFETY

Moscow UGOL' in Russian No 9, Sep 79 pp 3-5

[Article by V.D. Nikitin, first deputy minister of the coal industry of the USSR: "Creation of Safe and Healthy Working Conditions for Soviet Miners--A Major Social Goal"]

> [Text] The state is concerned about improving the conditions and protecting labor, about its scientific organization, about the reduction and in the future the complete exclusion of heavy physical labor on the basis of complex mechanization and automation of production processes in all sectors of the national economy.
> (USSR Constitution, Article 21)

The Communist Party and the Soviet government, manifesting constant concern about labor protection for the Soviet people, are advancing as a basic goal the complete improvement and betterment of working conditions on the basis of complex mechanization and automation of production processes and introduction of the advances of science and technology in production. In the program of social development and improvement of the living standard of the Soviet people developed by the 25th CPSU Congress, attention was again directed to the necessity of improving the socioeconomic and production conditions of labor, of all-possible reduction of manual, low-skilled and difficult physical labor.

Bettering and easing the conditions of labor are one of the important goals of the vast program of social changes being carried out by the Soviet nation at the present time. This task faces the coal industry with especial acuteness. Guided by the decisions of the party and the government in the field of further improvement of labor protection, the USSR Ministry of the Coal Industry is directing its efforts to equipping the enterprises with modern equipment, the improvement of technology, introduction of new means of safety engineering and industrial sanitation, and the improvement of organized preventive work for prevention of accidents, mishaps and occupational diseases.

Providing safe working conditions is closely connected with improving the structure of the mine fund, since the problems of labor protection and safety engineering are solved most completely and effectively during the construction of new and the reconstruction of operating mines. Put into operation during the 10th Five-Year Plan were eight new mines, 42 old mines were closed and 20 small mines were joined with mining operations. Reconstruction was completed at 28 mines. In the main coal basins construction of large mines of a new type is being conducted. These are mines outfitted according to the latest word in equipment. Thus, put into operation in the Kuznetsk basin was the "Raspadskaya" mine with a designed capacity of 7.5 million tons of coal per year, in the Karaganda basin the "Kazakhstanskaya" mine with a capacity of 2.9 million tons per year, and in the Pechora basin the "Vorgashorskaya" mine with a capacity of 4.5 million tons of coal per year. The "Dolzhanskaya-Kapital'naya" mine with a capacity of 4.2 million tons of coal per year and the "Zhdanovskaya-Kapital'naya" mine with a capacity of 3.6 million tons are being built in the Donets Basin.

The extensive introduction of modern mining equipment has made it possible to complete the mechanization of many basic labor-consuming processes and particularly for the extraction of coal in the working faces. The mechanized complexes have become the basic and most effective means of technical re-equipment of the coal mines, having a substantial effect not only on the technico-economic indicators but also on the safety of operations. In 1978 62.8 percent of the total extraction of coal by the underground method fell to their share. Introduction of mechanized complexes has created the real prerequisites for solving in the near future a major scientific-technical and social problem--accomplishing coal extraction without the constant presence of people in the face. Further expansion of the field of application of complex mechanization of extraction operations will be implemented owing to the development of very thin, high-capacity, steep and inclined beds with an unstable or hard-to-control roof. New types of complexes, intended for operation under these conditions, are being created and prepared for series production.

Expansion of the volumes of performing preparatory work with the use of tunneling combines, with which 35.2 percent of the excavations was conducted in 1978, has essential significance for improving the safety of operations in the mines. Developed in the 10th Five-Year Plan and being produced are the new GPK and 4PP-2 tunneling combines, making it possible to perform excavations on rocks with a strength of f=4-6 according to the scale of Prof M.M. Protod'yakonov with the angle of incline of the excavations up to 10 degrees, and also the KN-5N ("Kuzbass") tunneling complex is being produced. The "Soyuz-19" equipment complex for excavating through rocks with a strength of up to f=8, has been created and has undergone industrial testing, and a unified series of tunneling combines is being developed.

Metal timbering of different designs has received preferential use during excavations. At the start of 1979 reinforced with this timbering were excavations the extent of which came to 64.7 percent of their total length.

The use of conveyors is contributing a great deal to the reduction of accidents in underground transport. In 1978 the level of conveyorization for horizontal excavations came to 22 percent and for inclined excavations 83 percent and in the last 10 years it has increased more than two-fold.

Considerable attention is being given to the improvement of rail transport, which at the present time is the basic method in horizontal excavations. The production of the K-10 and K-14 contact electric locomotives with improved operating parameters has been developed and the introduction of them has been started. Storage battery locomotives are being created with an adhesion weight of from 7 to 28 tons, control of which will be accomplished for the first time using a thyristor system. Work is being done to create high-frequency locomotives, and also diesel cars. New unitized rail cars are being developed and introduced with a capacity of 2.5 cubic meters with bottom dumping; sectional trains are being developed; monorails with a cable thrust member are in series production, as are monocable roads for people transport; and an experimental model of a monorail with diesel drive has been manufactured.

Development of the most productive and safe open method of coal extraction is being implemented at advancing rates. While in 1950 its proportion in the total volume of extraction came to 10.7 percent, and in 1970 it was 26.7 percent, in 1980 it is planned to bring this up to 36 percent.

Along with this it is necessary to note that in the process of further improvement of working conditions in the coal industry it is necessary to overcome the negative influence of a number of objective factors. Development of coal extraction by the underground method is occurring under the conditions of a constant increase in complexity of mining and geological conditions. The depth of performing mining operations is increasing. In 1978 the number of mines with a working depth of over 600 meters came to 162, and at 16 mines operations are conducted at a depth of 1,000 meters and more. An increase in the depth of working leads to growth in the abundance of gas and the danger of blow-outs, and also to an increase in the number of mines with high temperatures. There is also an increase in the inclination of the beds to self-ignition, an increase in the fire hazard and dust-emission, and the conditions of maintaining and ventilating the excavations become more complex. The number of mines of category III for gas and higher categories rose 1.5-fold in the last 10 years, and the number of beds with blow-out danger being worked increased 2-fold. These mines comprise 50 percent of all the mines in the sector. The relative gas abundance at certain mines reaches 100-120 cubic meters per ton. For the purpose of improving the ventilation of mining excavations every year the ventilation is renovated at 40 mines, and over 100 ventilators for the main ventilation are put into operation or replaced by more productive ones.

In order to meet the tolerable norms of methane content ventilation schemes have been developed and are being used with freshening of the

outgoing ventilation streams, making it possible in combination with different degasification methods under the conditions of gas mines to insure a high load on the longwall. In the case of column systems of working with extinguishment of the excavation followed by advancement of the faces in order to eliminate dangerous accumulations of methane at associated longwalls with ventilation drifts, it is isolated and diverted from the worked spaces using gas-suction units. Degasification of coal beds and the worked space is widely used, and it is an integral technological process during coal extraction at gas mines. At the present time degasification is being performed at 196 mines, and 1.3 billion cubic meters of methane is drawn off per year.

In order to insure reliable control over the content of methane in the mining atmosphere at gas mines, portable automatic methane alarms have been introduced, as has a system of automatic gas protection (AGZ; avtomaticheskaya gazovaya zashchita), which transmits continuous information about the content of methane in the places where the pickups are located and records the information. In the case of an increase in the maximum tolerable content of methane, voltage is automatically cut off from the electrical equipment. The AGZ apparatus has been introduced at 318 mines, and by 1980 all catebory III mines for gas and higher category mines will be equipped with it.

In operation at the present time are more than 60,000 SMP-1, SSh-2 and SMM-1 methane alarms. Extensive introduction of methane alarms combined with the SMS-1 headlamp has begun. Developed and undergoing testing is the "Moskva" system which provides automatic control over the atmosphere of excavations under the conditions of mines which are dangerous for sudden discharges of coal, rock and gas. Improvement of the systems of automatic gas protection and the equipment of mines with systems of dispatcher control of the ventilation will make it possible to proceed to the creation at mines of automated air-distribution systems controlled using electronic computers.

An increase in the volumes of extracted and transported coal, the introduction of highly productive equipment, and intensification of mining bring about an increase in dust formation. Plans of complex dust removal have been developed and introduced at practically all mines in order to insure normal sanitary-hygienic working conditions. The complex of dust-removal measures in the working face includes: wetting down the coal mass, watering, covering sources of dust formation; in the development face it includes flushing when drilling holes and wells, sprinkling the chipped off mining mass before and during loading, and sprinkling and dust removal during operation of the tunneling combines. For conveyor transport the complex of measures includes sprinkling at the places of loading and transferring the chipped off mining mass. Water screens are used to treat the initial ventilation streams. The dust content of the air has been reduced sharply in the working and development faces as a result of introduction of the complex of dust removal measures.

In recent years systems have been created for the sprinkling of the cutting face with water by the combine blades, which insures higher effectiveness of dust suppression and excludes the probability of ignition of the methane by the friction sparks. The 4PP-2 tunneling combines and also the newly created stopping combines are equipped with such systems. Created for the 1GSh-68 and KSh-3m combines were dust-removal units based on mine vacuum cleaners, which in addition to sprinkling reduce the dust content of the air in the face by not less than five-fold.

A method of dust suppression using foam has been developed and gone through extensive industrial testing for the purpose of increasing the effectiveness of hydro-dust removal when flushing thin coal beds (especially anthracite), when the use of ordinary watering is made difficult.

In those cases when the complex of dust removal measures does not provide a lowering of the dust content of the air at the work places to the normative level, means of individual protection of the respiratory organs of the miners are widely used. New models of dustproof respirators, the PRSh-741, PRSh-742, and RPA-73 have been developed and have successfully undergone industrial tests. In comparison with those that are in series production these have an increased dust capacity, higher effectiveness of dust retention and reliability in operation.

The coal industry is faced with a serious problem of preventing blow-outs of coal, rock and gas. Work in this direction is being conducted in accordance with the complex program for 1975-1980, providing for the conduct of a broad group of research, the development of local and regional measures for preventing blow-outs, provision of mines with the necessary mechanisms and equipment, and also the implementation of a number of organizational measures. The number of working faces operating under full protection has been increased from 135 in 1975 to 199 in 1978, and those equipped with shielding units has increased from 24 to 44. During this same period the number of development faces outfitted with tunneling combines increased from 275 to 358. Regional preventive measures are being used at 194 working faces and 181 development faces on beds where there is the danger of blow-outs.

Work for creation of new methods and technical means for development of coal beds where there is the danger of blow-outs, and also for methods of forecasting and preventing sudden blow-outs of coal and gas has received further development. At the mines services have been organized for forecasting blow-outs and for control over the effectiveness of methods of preventing them. Developed and put into effect were instructions on the safe conduct of mining operations at beds inclined to sudden blow-outs of coal, rock and gas, and technological schemes of performing development and cleaning operations as well as promising schenes of utilization of protective beds. All this made it possible to reduce the number of sudden blow-outs of oil and gas 2.4-fold in three years of the 10th Five-Year

Plan by comparison with the corresponding period of the 9th Five-Year Plan, and to reduce injuries from sudden blow-outs 2.3-fold.

In addition to the development of methods of combatting blow-outs and methods of forecasting in recent years more and more significance has been given to implementing measures to insure the safety of workers in the case of sudden blow-outs. Among these are: squalling, remote control of equipment setting up mobile rescue stations, shelters, group and individual compressed air taps.

In order to insure normal working conditions in deep mines, stationary refrigeration units and mobile conditioners have been developed and introduced which together with mining engineering measures provide the necessary lowering of the temperature of the mine air at the work places to the levels established by the safety rules.

The fire protection of mines has been improved considerably. From 1966 through 1978 the number of underground fires was reduced 3.7-fold. In the last five years at the mines in order to increase the fireproof level of mine excavations and reduce the fire danger of mining machinery and equipment, 4,300 junctions, and 1,750 rooms with electrical equipment and the excavations adjacent to them were refastened with inflammable timbering. Also reinforced was 85.2 percent of the total extent of mining excavations, and 62.6 percent of the hard-to-burn. Widely used are electrical cables with sheathes or protective coatings which do not spread burning, and anti-combustibleconveyer belts. Mechanized working complexes have been fully converted to a non-combustible emulsion, and only dry filler is used in transformers. In 1978 additionally laid in the mines was 560 kilometers of fire and sprinkling pipelines, and the diameter of the pipes has been increased on a section 345 kilometers long.

Especial attention is being given to insuring fire protection of the driving heads of the belt conveyors, and the rooms with electrical equipment through extensive introduction of means of automation and signalling. However the demand for these units is not being fully satisfied. Used for eliminating fires on conveyors, trestles, and galleries are the more improved automatic units "Tuman,", "Sneg" and the UVG [not futher identified], and highly effective water, foam and powder means of fire extinguishing. The highly effective GIG-4 generators of inert gases are used for extinguishing fires in the mines. The output of the "Kvant," "Sigma" and other thermal radiation indicators is being set up for detection of endogenic fires.

Thanks to the introduction at the mines of new more effective means for extinguishing fires and outfitting mine-rescue groups with them the overwhelming majority of underground fires (84.2 percent in 1978) was eliminated by the so-called active method of direct extinguishment.

It is necessary to solve a number of problems in order further to improve the safe working conditions in the coal mines. It is planned for the USSR

Ministry of the Coal Industry jointly with the USSR Academy of Sciences and organizations of other ministries and departments to implement a broad program of scientific research, as a result of which the following should be worked out and developed:

More improved methods and means for controlling mine pressure in the working and development faces;

The method and means of safe and highly productive development of the gas bearing and blow-out prone coal beds of the Donets Basin;

A system of automatic control and management of mine degasification;

A system of automatic detection of developing foci of fire, and systems of effective means of underground fire extinguishment (including automatic);

An automatic system of quenching the front of the flames of an explos of methane-air mixtures in mines, and also a complex of means and methods for remote extinguishment of fires that are widely spread;

A system of life-support for people caught in locations of underground fires, explosions of methane-air mixtures and sudden blow-outs of coal and gas;

An automatic centralized system of control over the parameters of the blast network, explosive devices and the gas situation in the face.

It is necessary to note that the safety of operations greatly depends also on improvement of labor organization. An analysis of industrial injury and the results of investigation of accidents show that their basic causes are omissions in engineering work, inadequate control over observance of safety rules, violation of the technology of production, unsatisfactory organization of workplaces, and also poor labor and production discipline of individual engineering and technical personnel and workers. For this reason the USSR Ministry of the Coal Industry, the Central Committee of Workers in the Coal Industry and the USSR Gosgortekhnadzor [State Committee for Supervision of Industrial Safety and Mining Inspection] are constantly conducting a complex of organizational measures directed at further increasing the responsibility of the leaders and engineering and technical personnel of production associations and enterprises for observing safety requirements, strengthening engineering work to eliminate the causes and preventive work for prevention of accidents.

The following are done annually in order widely to enlist workers in solving problems of safety engineering:

There are all-union public inspections for labor protection and safety engineering at enterprises and in organizations. The best enterprises are awarded honorary certificates, diplomas and monetary prizes by a decision

of the collegium of the USSR Ministry of the Coal Industry and the presidium of the Central Committee of the Trade Union of Coal Industry Workers;

The demonstration of the achievements of the best enterprises in the "Coal Industry" Pavilion of the USSR Exhibit of National Economic Achievements and seminars for exchange of advanced work know-how in the area of achieving safe working conditions;

Conference-seminars with public inspectors for safety engineering. The best public inspectors are awarded special badges, diplomas, valuable gifts and monetary prizes.

Every year about 100,000 public inspectors for labor protection are selected in the coal industry as a whole. In 1978 alone they contributed more than 850,000 proposals, the realization of which contributed to improvement of the status of safety engineering in the sector.

Technical retooling of the coal industry and the implementation of a complex of technical and organizational measures for improving working conditions and safety have made it possible in the last 10 years to reduce industrial injury by 37 percent, to reduce the number of accidents 3.7-fold and the occupational disease rate 2-fold.

The experience of many enterprises, operating for a long time without accidents, shows that there are great possibilities in the sector for further reduction of traumatism and the accident rate. It is necessary only that the efforts of engineering and technical workers be directed first of all to elimination of existing shortcomings in organizational and preventive work for providing safe working conditions. The leaders of mines and production associations should give especial attention to the creation of a stable working front of operations, to observance of the established regimes of coal extraction and planned preventive repair of mining equipment, to improvement of the training of workers and dissemination of the advanced know-how of accident-free work.

10908
CSO: 1822

UDC [622.323+622.24].003.1

MEASURES PROPOSED FOR IMPROVING ECONOMIC MECHANISM

Moscow EKONOMIKA NEFTYANOY PROMYSHLENNOSTI in Russian No 11, Nov 79 pp 3-5

[Article by S.M. Levin, Ministry of the Oil Industry: "Improving the Economic Mechanism"]

[Text] The Central Committee of the CPSU and the USSR Council of Ministers, considering it necessary to implement a system of measures for further improvement of planned management of the economy, passed a resolution "On Improving the Planning and Increasing the Effect of the Economic Mechanism on Increasing the Production Efficiency and the Quality of Work."

The adopted resolution is a new important stage in the development of our economy, it focusses all administrative and planning activity on the achievement of high final national economic results.

Embracing a vast complex of administrative problems, the resolution determines specific measures for improving planning, it outlines ways of increasing the effectiveness of capital investments, and it heightens the role of cost accounting, of economic levers and stimuli.

Improvement of planning work occupies a priority position among these major measures.

Planning is the core of the management of the socialist economy, it is one of the fundamental advantages of our system.

The resolution establishes the procedure for compiling long-range and current plans, which will increase their effectiveness. The main changes are directed at increasing the significance of long-range and five-year plans as an important instrument of realization of the party's economic policy.

The necessity of heightening the role of long-range planning will be followed using the example of the oil industry.

The demands of development of the country's economy call forth the necessity of intensifying the development of oil and gas resources. Geological prospecting, and the time spent for development of new deposits substantially exceed the five-year period. The period of preparing for exploitation of oil deposits is also prolonged because this work is conducted, in the main, in undeveloped regions of the country. All this heightens the role of long-range planning for development of the oil industry.

The same situation occurs in the development and introduction of advances of scientific and technical progress. The process of development of scientific discoveries, as a rule, exceed the five-year period. The decisions adopted by the resolution establish that the Academy of Sciences of the USSR, the USSR State Committee for Science and Technology, and USSR Gosstroy will work out a complex program of scientific and technical progress for a 20 year period, with the singling out of five-year periods. It is necessary to reflect in this program not only what science can do, but also what should be done in order to insure the purposeful development of the country.

USSR Gosplan, jointly with the ministries, taking into account the complex program and based on socioeconomic problems, works out the basic directions of the country's economic and social development for 10 years by five-year periods. This draft is submitted for national discussion. On the basis of the approved basic directions, USSR Gosplan works out and brings to the ministries the control figures for the five-year plan with a breakdown by years. These control figures are given to the associations and serve for working out the drafts of the five-year plan.

The role of five-year planning as the chief form of management of economic and social development of the country is especially increasing. Target complex programs for the major directions and regions will be approved prior to the start of a five-year plan. Determined among the priority programs for the near future is the working out of problems of the saving of fuel and metal, construction of the BAM [Baikal-Amur Main Line] and industrial development of regions adjacent to it, reduction of the amount of manual labor, and expansion of the production of consumer goods.

Developed on the basis of the five-year plan is the annual planning, which confirms its assignments and insures their unconditional fulfillment.

For the purpose of further democratization of planning, and more complete consideration of the know-how of the masses, the annual plans are compiled beginning from below--from the production associations, and the enterprises.

The labor collectives, developing the socialist competition and mobilizing internal economic reserves, take on counter plans which are coordinated with the physical resources and included in the make-up of the annual program.

The principle of working out the assignments "from what has been attained" is being replaced by precise economic and engineering calculations. Being introduced in addition are effective standards of the outlays of resources for issuing the final product.

Such a procedure for working out the plans makes it possible to use a detailed analysis of the whole 20-year period and the initiative of the collectives when compiling the plan from below--in the associations.

The new system of planned indicators is being introduced at all levels of management. The work of the enterprise will not be evaluated according to the "gross," but according to the concrete contribution of the collective: the fulfillment of plan assignments in physical terms, growth of net output, and fulfillment of the specific orders of the consumers. This will stimulate an increase in effectiveness, improvement in the quality of the work and better utilization of fixed capital.

The utilization of a new planning indicator--the normative net output--is foreseen by the resolution. The value of the norm is determined by excluding material outlays from the wholesale price.

As a result, all the elements of price characterizing the outlays of past labor (not connected with the volume and labor-intensiveness of the production program of the given enterprise) are not part of the indicator of normative net output. Utilization of the latter for measuring labor productivity makes it possible to reflect more correctly the dynamics of this very important indicator. In sectors where there is the possibility of extensive use of in-kind indicators for measuring the dynamics of production, or the productivity of labor, for instance in the oil-extracting industry, namely such indicators will be used.

However the indicator of normative net output may find useful application also in the oil industry for such a subsector as machine building.

In the 11th Five-Year Plan a new planning indicator--the volume of commodity construction output (total and performed by in-house forces)--will be approved for construction organizations. The value of this indicator is determined as the cost of construction and installation operations for the enterprises turned over to the client, underway complexes, and projects prepared for producing output. The use of such an indicator in the planning and evaluation of economic activity of building organizations will contribute to reduction of the cycle of erecting finished projects, and to putting them into operation as fast as possible.

The measures for improving planning also include the wide application of the program-target method of planning, and working out the criteria of intensity of the plan assignments. The plans should be balanced better and provide for concentration of recources on fulfillment of target programs and the final sector goals.

Stability of the approved plans should be insured at all levels of administration. The requirement of steadfast observation of planning discipline, non-admission of plan adjustments in the direction of lowering it under the actual level of its fulfillment, is directly stated in the resolution.

Implementation of the group of measures for improving the economic mechanism requires extensive organizational and explanatory work. It is important to explain the basic principles of the resolution, and the significance of improving administration and planning, keeping in mind that improvement of national economic planning will serve as a reliable lever for raising the effectiveness of production.

In the course of reorganizing the planning mechanism it is necessary to preserve the innovative foundation, the scientific character of the principles of the resolution of the CPSU Central Committee and the USSR Council of Ministers.

It is necessary to introduce the new methods persistently and systematically, and their implementation is regarded by the party as a large-scale economic and political task. A system of preparatory operations is being carried out in the oil industry in the fulfillment of the indicated resolution. A coordination plan of scientific research is being worked out which provides for development of complex measures for improvement of sector planning and increasing the action of the economic mechanism on increasing the effectiveness of production in the sector. It is foreseen to do the following:

Heighten the role of sector five-year plans, the degree of their reliability and stability owing to performing economic and engineering calculations with respect to the volumes of extraction of oil on the basis of the reserves of oil in the industrial categories, the plans and technological scheme of working oil deposits;

Raise the level of planning capital investments and material and technical resources, and insure strict balance of them with the volumes of production;

Develop and incorporate wiiely in planning practice an automated system of planning calculations with the use of progressive norms;

Work out and carry out complex programs for a saving of metal and fuel, and for automation and mechanization of labor-intensive and manual operations;

Develop a system of economic incentives aimed at increasing the effectiveness of oil production, and at the most complete utilization of the resources of oil and casing-head gas;

Strengthen and develop the cost accounting methods of operation.

For the purpose of strengthening the normative basis of planning and cost accounting in scientific research institutes of the sector the following are being developed:

A regulation on a certificate for an industrial oil and gas extracting association;

A methods statement regarding sectorial planning in the oil industry;

Methodical instructions on the procedure for determining the intensity of plans in oil and gas extracting associations;

A system of progressive technico-economic norms and standards of outlays of labor, materials and specific capital investments;

A regulation on the formation and expenditure of the material incentive fund and the fund for social and cultural measures and housing construction for the future.

Along with this, measures are being prepared in the sector for the conversion of design-research to five-year planning, for development of a five-year financial plan broken down by years for the production associations, and for broad development of brigade forms of organization and providing labor incentives at the enterprises.

Performance of this extensive preparatory work in the established periods demands a qualitatively new level of activity of the sector's economic services and scientific research institutes.

The mission is to study thoroughly the indicated measures, comprehensively to translate them into reality in order without fail to place the new methods of operation in the service of the five-year plan.

(20 August 1979)

10908
CSO: 1822

UDC 621.643/553.002.2+331.876.4

SUMMARY OF OIL AND GAS INDUSTRY CONSTRUCTION ACCOMPLISHMENTS

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 11, Nov 79 pp 1-3

[Article: "Meeting the Great October Holiday"]

[Text] Long live the 62nd anniversary of the Great October Socialist Revolution!

Long live the Great October Socialist Revolution--the chief event of the 20th century, the beginning of a universally historic turning of mankind from capitalism to socialism!

From the appeals of the CPSU Central Committee to the 62nd anniversary of the Great October Socialist Revolution.

The Soviet people meet the 62nd anniversary of the Great October Socialist Revolution as the holiday of free labor and the universally historical victory of socialism.

The October Revolution radically changed the fate of our motherland, and ushered in a new, communist era in the development of mankind.

Each anniversary of the Great October is a new gain on the path of the country of the Soviets towards communism. The second year of the seventh decade of Soviet power has been marked by a further reinforcement of socio-political and ideological unity of our society, inviolable friendship of the peoples of the USSR, and growth in the economic and scientific-technical potential of the state of developed socialism.

The builders of the oil and gas industry enterprises are making a weighty contribution to the economy of the country. Advances in the development of the fuel and energy complex to a considerable measure are determined by the achievements in constructing facilities for the collection, extraction and transportation of oil and gas.

The 62nd anniversary of the Great October is marked by new labor victories of the workers in the enterprises and organizations of the Ministry of Construction of Petroleum and Gas Industry Enterprises.

Collectives in the trusts Severgazstroy, Samotlorneftepromstroy, SU-2 trust of Spetsstroymontazh and the Volokolamsk plant of construction designs have reported completion ahead of time of the planned assignments for 4 years of the 10th Five-Year Plan. The collectives of the trusts Tyumengazmontazh, Surguttruboprovodstroy, Promstroymaterialy, Bukharagazpromstroy and others are successfully coping with the adopted commitments.

The builders of the Mubarek gas refinery have won a great labor victory. The second phase of the enterprise has been put into operation. Ten billion m^3 of purified gas will annually enter the pipelines from Mubarek. The putting into operation of the new phase of the plant will make it possible to set up the industrial operation of such fields as Zevardy, Khauzak, and Dengizkul' which previously were not successfully utilized due to their high content of sulfurous gasses. On these fields 5 billion m^3 of pure natural gas and no less than 150,000 T of sulfur that is necessary for the production of mineral fertilizers can be obtained annually on these fields.

The new enterprise has been completely equipped with Soviet equipment. Five million R less have been spent for the construction of the second phase of the Mubarek gas refinery than for the construction of the first phase. The successful completion in short periods of a considerable volume of work was promoted by the broad development of socialist competition which was spearheaded by the subdivisions of the trusts Mubarekgazpromstroy and Sredazneftegazmontazh.

In the period of pre-October competition a pipeline was put into operation that connected two international gas mains, "Bratstvo" and "Soyuz." As a result the reliability of gas supply on these powerful arteries was improved. Thus, the builders of the oil and gas industry facilities in fulfilling their international duty made a worthy contribution to the development of the economic cooperation of the CEMA member countries.

A considerable volume of work was also carried out at such most important pipeline construction sites of the fourth year of the five-year plan as the oil pipeline Surgut-Polotsk and the gas pipeline Urengoy-Novopskov. In the pre-October days the second phase of the gas pipeline Urengoy-Chelyabinsk extending 1,750 km was constructed 2 months ahead of schedule. The reliable supply of fuel to many industrial enterprises and industrial centers depended on the putting into operation of this important structure in the country. The new gas main was laid 2 times faster than the standard schedules.

The line work on the route of the main gas pipeline Perm'-Kazan'-Gor'kiy extending over 900 km was successfully finished. The subdivisions of the trusts Lengazspetsstroy, Mosgazprovodstroy and Tatneftеprovodstroy that

were engaged here passed the test for technical maturity. The new gas trunk line noticeably reinforced the fuel and energy balance of the country's center. From the very beginning of winter gas was fed to the industrial enterprises and municipal residents of the Ural region.

In the socialist competition for early completion of the production assignments with high quality of labor great advances were made by the brigades headed by Yu. I. Kil'dyushev, M. I. Buyanov (association of Sibkomplektmontazh) and Yu. P. Gotsin (trust of Severgazstroy). These collectives are the initiators of the movement in the branch for a worthy meeting of the 110th anniversary of V. I. Lenin's birth. Their initiative was supported by many subdivisions of the Ministry of Construction of Petroleum and Gas Industry Enterprises.

High production results were attained by the Komsomol-youth collectives of the shock worker construction sites. KMMU-4 of Tyumengazmontazh, KMSU-53 of Urengoygazpromstroy, KMSU-51 of Nefteyuganskgazstroy, and KMSMU-2 of Severgazstroy were in the vanguard of socialist competition.

Reporting on the labor achievements in honor of the 62nd anniversary of the Great October Socialist Revolution the collectives of the Ministry of Construction of Petroleum and Gas Industry Enterprises at the same time concentrate attention on the solution of the primary tasks.

The fourth quarter of this year is an especially important one. The implementation of the program of this quarter to a considerable measure governs the fulfillment of the 1979 plan, which in turn predetermined the successful completion of the assignments for the 10th Five-Year Plan as a whole. Therefore a paramount task of the branch toilers is to put all reserves of production into operation so that the annual plan of construction-assembly work is realized by 29 December in accordance with their socialist commitments.

Indispensable conditions for the early completion of the annual program is the efficient supply of the objects to be constructed with the necessary materials and equipment; the use of advanced technology and equipment, and the leading experience; the most complete use of machines; guarantee of high quality work; strict fulfillment of the established schedules; strict observance of the planning, financial and labor discipline; organization and coordination in all links of construction production. All of this makes increased requirements for the leading personnel, in the first place, for the direct executors.

The increased scales and high rates of construction of oil and gas industry enterprises and the complication of the bonds between all participants in the construction dictate the need for a constant perfection in construction control. This is why each economic leader must know and be good at a lot. First of all--to study and employ the leading methods of control, possess a feeling of the new, see the outlook for branch development, and find the optimal solutions to the emerging problems.

Under conditions where in the subdivisions of the Ministry of Construction of Petroleum and Gas Industry Enterprises measures are implemented to fulfill the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improvement of Planning and Intensification of the Effect of the Economic Mechanism on Improvement in the Effectiveness of Production and the Quality of Work" the duty of the leaders of all levels is to organize the activity of the collectives they head such that prerequisites are created for a timely and successful transition to a new system of economic work.

The decisions of the party and government to perfect planning and the economic mechanism open up new potentialities to search for efficient methods of management and the manifestation of the creative initiative of the workers. The responsibility of the leaders and of each worker for the fulfillment of the production assignments and the socialist commitments increases.

Socialist competition is one of the important levers in perfecting control. Today the struggle for complete realization of the potentialities of developed socialism, acceleration of scientific and technical progress, and steady rise in the efficiency of production and quality of work are in the center of attention of the competitors. A characteristic feature of socialist commitments has become their deeper economic substantiation, focus on the achievement of the highest final results. This is specifically reflected in the labor accomplishments of the competitors and in the spread of new patriotic initiatives.

Socialist competition for early completion of the assignments of the 10th Five-Year Plan, and increase in the efficiency and quality of work has been widely unfolded at the oil and gas industry construction sites. Since the effect of the competition results on the economic indices of activity is intensifying ever more, it is necessary to focus especial attention on the spread in the branch of the movement "Work without Laggers," as well as the development of competition between cooperating workers on the principle of "worker's relay race."

Competition of the scientific and engineering-technical workers based on personal and collective creative plans directed towards perfection of construction and increase in its efficiency has great importance for the accelerated introduction of the achievements of science and technology into the practice of construction of oil and gas industry enterprises.

Competition has been well organized according to the creative plans in Glavsibtruboprovodstroy [Main Administration for Construction of Oil Pipelines and Pipelines in the Regions of Siberia], in the Kiev branches of the special design office "Gazstroymashina" and VNIIST [All-Union Scientific Research Institute for the Construction of Trunk Pipelines], and in the trust Ukrneftegazmontazh. In the personal plans of the Ukrvostokneftegazstroy a great place is occupied by the developments directed towards the introduction of the brigade contract, perfection of the

technology of welding operations, and guarantee of the timely putting into operation of the most important objects. Personal creative passports have been introduced in the trust Omskneftеprovodstroy to evaluate and take into account the participation of each engineering-technical workers in the competition.

However, in a number of subdivisions (Glavkonigazneftestroy, trusts of Vostokneftеprovodstroy, Bashneftepromstroy, Neftеprovodmontazh and others) insufficient attention is still given to socialist competition of the engineering-technical workers for personal and collective creative plans. In certain organizations (Sibkomplektomontazh, Surgutneftepromstroy) such plans often bear a general nature.

For further activation of the activity among scientific and engineering-technical workers of the Ministry of Construction of Petroleum and Gas Industry Enterprises system it is necessary to unfold more widely the socialist competition based on personal and collective creative plans, to concentrate the efforts of specialists on solution of problems concerning the social-economic development of the branch and the tasks facing the labor collectives. The course of fulfillment of the creative plans should be regularly examined in order to exchange experience, reveal shortcomings and adopt measures for their elimination.

The successful completion of the assignments, scientific and technical programs for solution of the most important problems, as well as the most rapid introduction of the finished creative developments must be promoted by the clear fulfillment of contracts on creative cooperation concluded by the scientific research and planning institutes with the enterprises and organizations.

In order to increase the efficiency of socialist competition among the specialists it is planned to hold a competition in 1980 for the best introduced work on personal (collective)creative plans.

The movement for saving and thrift should be further developed in the branch.

There are still cases of an uneconomical attitude towards safety and the use of construction materials. Thus, in the trusts of Glavtruboprovodstroy [Main Administration for the Construction of Oil Pipelines and Pipelines] pipes, insulation materials, precast reinforced concrete items and metal anchors are not stored satisfactorily. At the same time above-standard supplies of materials are permitted, as a result of which the turnover of financial and credit resources is delayed.

In order to improve the economic activity the task has been set of bringing the supplies of materials in 1980 to the established standard; intensifying control over the correct use and storage of materials and equipment; and bringing to disciplinary responsibility the individuals who permit unsatisfactory storage of material valuables.

Among the important tasks to be solved by the toilers of the branch in the fourth quarter is reduction in the periods for construction of residential and cultural-general objects. In the central boards and associations headquarters have been set up for rapid solution of the questions of material and technical supply and guarantee of the equipping of objects according to the weekly-daily schedules, and monthly control of the course of kindergartens has been set up. The output of items at the house-construction kombinats is increasing, and industrial designs are being introduced in the erection of children's preschool institutions.

The collectives of the Ministry of Construction of Petroleum and Gas Industry Enterprises are doing everything necessary so that before the end of the fourth year of the five-year plan the socialist commitments are fulfilled with honor, and a reliable reserve is created for efficient work under new conditions of management.

The labor achievements with which the builders of the enterprises of the oil and gas industry meet the 62nd anniversary of the Great October Socialist Revolution are the pledge of their successful completion of the 1979 plan and the realization of the assignments of the 10th Five-Year Plan.

> Workers of the Soviet Union! Increase output, efficiency and quality of labor at each work site! Fight for the successful completion of the 1979 plan and the assignments of the 10th Five-Year Plan!
>
> Glory to the leading collectives, the shock workers of the five-year plan in the vanguard of communist construction!
>
> Workers of the Soviet Union! Actively participate in further perfection of socialist production, and the acceleration of scientific and technical progress!
>
> Use more fully the reserves for attainment of high final national economic results, and for an increase in the output of highest quality items!
>
> Workers of construction! Put into operation in good time the production plants and facilities, and increase the effectiveness of capital investments!
>
> Build with high quality, economically and on a modern technical base!
>
> From the appeals of the CPSU Central Committee to the 62nd anniversary of the Great October Socialist Revolution.

9035
CSO: 1822

UDC 658.52.011.55

FORMATION AND ARRANGEMENT OF GAS AND OIL CONSTRUCTION INDUSTRY MATERIAL BASE

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 11, Nov 79 pp 19-21

[Article by A. I. Stoyanov, Ministry of Construction of Petroleum and Gas Industry Enterprises, in the column "Outlook, Problems, Tasks": "Formation of the Material Base for Construction of Objects in the Oil and Gas Industry"]

[Text] The arrangement of the objects in the oil and gas industry, like its material base of construction, is subject to the general laws of socialist arrangement of production forces. But the process of production in each branch has its peculiarities whose basis is the differences in the equipment and technology, natural conditions, type of employed raw material, materials and manufactured product.

The structure of arrangement of enterprises for the material base of oil and gas construction is affected by the territorial distribution of the objects to be constructed, natural climate conditions, types of employed construction products, and the level of technical progress.

The main volumes of oil and gas construction now are concentrated in the north and east of the country which governs the structure of the territorial consumption of material resources.

The largest regions of consumption of material resources produced by the production base of the Ministry of Construction of Petroleum and Gas Industry Enterprises--West Siberia, northwest, Central Asian, Volga, and Urals. These regions require considerable amounts of items made of precast reinforced concrete, unitized devices, pipe assemblies and blanks, etc.

The swampy state, severe natural and climate conditions, and the difficulties linked to this in laying the railroad trunk lines in West Siberia determined the prerequisites for the development of road construction which is a major consumer of reinforced concrete road slabs, paving asphalt, concrete and inert materials.

The nature of the consumed products defines a great deal the types of transportation used to haul them.

Distinguishing features of the products for the material base of oil and gas construction are the considerable weight of the items and their large overall dimensions. The products of the enterprises producing pipe assemblies and blanks, construction and technological metal structural parts, installation assemblies and parts, and products of the repair enterprises of construction equipment have large radii of hauling (from the central economic regions to the newly developed regions), which naturally affects the selection of the means for delivering them. To deliver products of the enterprises in the material base of the Ministry of Construction of Petroleum and Gas Industry Enterprises it is necessary to use all types of modern transportation: railroad, water, automobile, pipeline, air, including heavy-freight airplanes and helicopters.

Consideration of the peculiarities of transportation has great importance in planning the regional development of the material base for the oil and gas construction.

In arranging the material base enterprises it is necessary to take into account the effect and peculiarity of the consumed raw material resources and their transportability, degree of abundance on the given territory (or their absence).

The industrial enterprises of the material base for oil and gas construction are distinguished by great diversity in the employed raw material and materials. They include products of metallurgical production (rolled items of ferrous and nonferrous metals), lumber and wood-working industry, industry of construction designs and construction materials (nonmetalliferous materials, cement, insulation materials, etc.). It is necessary to make a differentiated estimate of the effect of the type of raw material resources on the arrangement of material base enterprises. For oil and gas construction new construction materials are now widely used. Thus, recently output of structural parts made of light metals has started. Certain types of construction parts which previously were only made of wood or concrete, now are being replaced with items made of plastic or light metals. The institutes and design offices of the Ministry of Construction of Petroleum and Gas Industry Enterprises (VNIIST [I. M. Gubkin Moscow Institute of the Petrochemical and Gas Industry], northern branch of the VNIIST, SibNIPIgazstroy [Siberian Scientific Research and Planing-Design Institute of Gas Construction], Experimental Design Office for Reinforced Concrete, and the Special Planning-Design Office "Neftegazspetsmontazh", are carrying out extensive work to create modern, light and efficient materials.

Progressive materials and structural parts occupy a considerable percentage in the overall consumption of material resources, and especially in the construction of objects of the oil and gas complex of West Siberia.

The products of the material base enterprises of oil and gas construction are distinguished by greater materials consumption. The percentage of cost of raw materials in the product net cost is from 45% (in the European

regions of the country) to 90% (in the regions of the extreme north and Siberia). Consideration of the raw material and materials cost is necessary in an examination of the efficiency of development and arrangement of material base enterprises.

The most materials-consumptive are the products made of reinforced concrete, concrete, mortar and paving asphalt. These products are needed everywhere that oil and gas field and oil and gas pipeline construction is underway. Outlays for their production are insignificant. The outlays for transporting the raw material in many cases, especially in the West Siberian and East Siberian regions, exceed many times the net cost of production. These peculiarities, seemingly, govern the need for bringing the production of reinforced concrete, concrete, mortar and paving asphalt closer to the raw material sources. However, due to the technological peculiarities and distribution of the objects of oil and gas construction the production of reinforced concrete gravitates towards the objects to be constructed.

The production of carpentry items for oil and gas construction is nonspecific, and this places certain limitations on the use of the plants and their arrangement.

The nonspecificity of production, as well as the absence of an in-house raw material base for the production of carpentry items govern the need for bringing the wood-working enterprises closer to the raw material sources and the transfer of these enterprises to the specialized organizations (USSR Ministry of Timber and Wood-Working Industry) for their more efficient use.

In the northwest, West Siberian and East Siberian regions the wood structural parts are used in a considerable quantity to erect objects of residential and cultural-general purpose, therefore the Ministry of Construction of Petroleum and Gas Industry Enterprises for these regions has provided capital investments for construction of wood-working shops.

The enterprises for production of metal structural parts and installation blanks as a consequence of the large transportation outlays to deliver the finished products, considerable weight of the items, as well as the relatively high level of labor outlays should be placed near the regions of consumption.

In the regions of new development (West Siberian and northwest) it is recommended that these enterprises be placed in zones of concentrated construction (Tyumen', Surgut, Nadym, and Ukhta).

The factors that affect the development and arrangement of enterprises for the material base of oil and gas construction include the level of technical progress attained in the different branches of the national economy. Thus, thanks to the development of technical progress in metallurgy conditions were created for the use in oil and gas construction of new and high-quality brands of steel, profiled rolled products, and rolled

products made of light alloys. Technical progress in the chemical industry guaranteed the possibility of creating new insulation materials and polymers which have been used in pipeline construction. Machine-construction enterprises supply for oil and gas objects the more advanced and highly productive machines and mechanisms.

Currently, the branch of oil and gas construction is equipped with highly productive equipment that makes it possible to significantly reduce the outlays of manual labor and carry out great volumes of construction-installation work in all economic regions of the country regardless of their natural and climate conditions.

A new type of transportation has been created in the branch (pneumatic and hydraulic drive), in addition, the carrying capacity of traditional types of transportation has been increased. The special design office "Gazstroymashina" is developing new types of swamp-traveling machines. The increase in the fleet of construction machines in the branch created prerequisites for the development of an industrial repair base.

Thus, technical progress in different branches of the national economy promotes the development and perfection of the structure for enterprises of the construction industry, and affects their arrangement.

Conditions have been provided for the introduction of the achievements of technical progress at the material base enterprises of oil and gas construction.

At the objects of the operational-repair base of construction machines and transportation resources new types of line-aggregate repair of machines and their maintenance have been introduced.

The installation and specialized organizations use advanced methods of enlarged assembly of parts and equipment.

At the reinforced concrete, concrete-mortar and paving asphalt enterprises the production processes have been completely mechanized, and in certain cases also automated.

Thanks to the technical progress broad possibilities are opened up for the production of new and efficient types of products promoting a change and perfection in the structure of the material base for oil and gas construction, which in turn, has a significant effect on its regional arrangement.

The development and arrangement of material base enterprises depend a great deal on the employed forms of social organization of production and especially their specialization.

The effectiveness of specialization can be determined by comparing the relative outlays for different enterprises

$$\frac{C_1 + E_н K_1 + T_1}{C_2 + E_н K_2 + T_2} \geq 1,$$

where $C_1+E_нK_1+T_1$--relative outlays of a universal enterprise; $C_2+E_нK_2+T_2$--relative outlays of a specialized enterprise (C, $E_н$, K, T--respectively net cost, standard coefficient of efficiency, capital investments, transportation expenditures).

The forms of specialization differ: subject, which is used at the enterprises for output of unitized devices, plants for major repair of construction machines and mechanisms, in shops for production of window and door units, etc., and technological used at enterprises for production of concrete mixtures.

The form of specialization must be selected based on the technical-economic substantiation with regard for the fact that the increase in the level of specialization, like the concentration of production, with other conditions equal results in an increase in the radius of hauling, and this means a growth in the transportation expenditures.

Such forms of social organization are closely linked to specialization of production as cooperation and combination. They have become most widespread in the production of installation blanks and at enterprises for the repair of construction equipment. The economic efficiency of cooperation and combination is determined by the following correlation:

$$\sum П^{к}_{зт} < \sum П^{i}_{зт},$$

where $\sum П^{к}_{зт}$ — total relative outlays of cooperating enterprise; $\sum П^{i}_{зт}$ — total relative outlays of non-cooperating enterprise.

Study of the factors for formation and development of the material base made it possible to draw the conclusion that in the oil and gas construction a broad nomenclature of plants is used for the output of material resources included in the composition of the industry of building structural parts and parts, and the industry of construction materials.

The employed plants of the material base can be divided into three groups. The first includes specific plants: for the production of unitized devices; for the production of pipe assemblies and blanks; for insulation-welding bases; for the output of resources to secure pipelines (reinforced concrete weights and anchors); for the output of polymer film glue for anticorrosion insulation of the pipelines.

In compiling the annual, five-year and long-term plans in the first place it is necessary to provide for capital investments for the development of specific plants, while their regional placement should be linked to the arrangement of the construction objects of the oil and gas industry since

the specific plants guarantee the development only of the oil and gas field, and oil and gas pipeline construction.

In compiling the branch and complex schemes for development and arrangement of the material base these plants are isolated as specific, and the balances of production and consumption of the products they manufacture are compiled only for the development of the oil and gas industry.

The second group includes the general-construction plants: wall materials; nonmetalliferous materials; porous fillers; steel structural parts; structural parts and items made of aluminum and aluminum alloys; carpentry items; lumber; cast pig iron; paving asphalt, and others.

The third group is the auxiliary plants: moorages, roods, etc.

A characteristic feature for the development of the general-construction plants is that for their effective use and development the capital investments for the construction of material base enterprises must be allocated on percentage principles with other ministries and departments, with regard for the fact that these enterprises will be developed in the form of interbranch (group) enterprises that guarantee the needs of construction of all branches of the regional national economy in which they are placed. The plans for development and arrangement of the general-construction and auxiliary plants are matched with the complex regional plans for the arrangement of enterprises for the construction industrial base. In compiling the plans for the arrangement the general-construction and auxiliary plants must be included in a unified regional balance of plants for the output of construction designs, parts and materials.

In the regions of new development and in certain regions of West Siberia, i.e., in the regions where only the Ministry of Construction of Petroleum and Gas Industry Enterprises implements contract construction, the general-construction and auxiliary plants need to be developed by means of capital investments allocated by the Ministry of Construction of Petroleum and Gas Industry Enterprises, i.e., in the same way as the specific production.

Consideration for the peculiarities of the formation and arrangement of material base enterprises for oil and gas construction in planning its long-term development will promote a considerable saving of state capital investments.

For the further development of the material base and an increase in its industrial potential the developments PI-2 of the USSR Gosstroy and SibNIPIgazstroy of the Ministry of Construction of Petroleum and Gas Industry Enterprises ("Scheme for Development and Arrangement of Material and Technical Base of the Ministry of Construction of Petroleum and Gas Industry Enterprises for 1976-1990") envisage:

--use of unitized devices in the construction of oil and gas industry objects in the regions of Siberia and the Far East;

--expansion of the plants for the output of special and all-terrain equipment on the basis of the extant enterprises in the branch for the production and repair of construction equipment;

--organization in Tyumen', Surgut, Nadym, as well as in the regions of East Siberia of support-administrative bases to provide long-term development of the oil and gas extracting industry;

--conducting of measures by the material base enterprises of the Ministry of Construction of Petroleum and Gas Industry Enterprises and other ministries and departments for the development of the oil and gas industry in volumes corresponding to the demands of the national economy.

It is economically expedient to increase the supplies of materials and structural parts that are nonspecific for the Ministry of Construction of Petroleum and Gas Industry Enterprises and that are manufactured by the enterprises of other ministries and departments, and in turn, at the enterprises of the material base for the oil and gas construction, to increase the volumes of production of the products that are specific for the branch--insulation materials, pipe assemblies and blanks, light construction materials and other items that guarantee accelerated construction of the objects of the oil and gas industry.

9035
CSO: 1822

UDC 622.279.23/4

GAS CONDENSATE AS A FUEL AND RAW MATERIAL

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 8-10

[Article by O. F. Khudyakov and V. A. Khlebalkin, All-Union Scientific Research Institute of Natural Gas]

[Text] The main factor which determines the efficiency of condensate use for national economic needs is the content of light hydrocarbon fractions in it, which makes possible refining of it into fuel or its use as raw material for petrochemical synthesis.

A large number of gas-condensate fields containing pentanes and higher boiling hydrocarbons in their gas which begin to precipitate out of the gas in the bed in the form of condensate with reduction of pressure, has now been discovered in the USSR. The specific weight of gas-condensate pools in the total number of discovered gas fields increases with an increase of well-drilling depths, which will contribute to further increase in the volumes of condensate production.

The main condensate reserves are concentrated in several regions in the Komi ASSR, Orenburgskaya Oblast, Tyumenskaya Oblast, the Ukrainian SSR and the Turkmen SSR.

For proper selection of the directions of refining the condensates of gas condensate fields, one must know their physicochemical characteristics. Fraction and group compositions occupy an important position among the many physicochemical characteristics determined during investigation of the condensate.

The condensates of various gas-condensate fields boil off up to 60-80 per cent up to 200°C, but along with this they contain high-boiling hydrocarbongs whose boiling point is above 360°C.

The sulphur content in the condensates fluctuates from traces to significant values. Among the condensates which we investigated, that of the Orenburg field is characterized by especially high sulphur content.

The viscosity of stable condensates is within the range of 0.6-2.2 cSt at 20°C. There were usually no resins and asphaltenes in the studied condensates. The condensates are colorless or tinted a light yellow. There are absolutely no unsaturated hydrocarbons in them.

The condensates separated from the gas of different fields differ appreciably from each other in fractional composition. One of them boils off in the temperature range corresponding to gasoline fractions (for example, the condensates of the Orenburg, Ust'-Vilyuysk and Pungino fields), others (most of the studied condensates are a mixture of gasoline and diesel fuel fractions) and finally there are those whose composition, although in small quantities, contains petroleum fractions (the condensates of the Krestishchenskoye, Russkiy Khutor and other fields).

Thus, gasolines, kerosenes, diesel fuel and other petroleum products can be produced from condensates on the basis of their fractional composition.

A large volume of available data on the physicochemical characteristics of West Siberian condensates and their group composition permits one to clearly distinguish three types of condensates: the first are napthenes, the second are methanes and the third occupy the intermediate position.

Condensates from gases of the Valanzhin-Heteriv deposits of Krasnoyarskiy Kray (the Soleninskoye and Pelyatkinskoye fields) consist of mainly 70 percent of naphthene hydrocarbons.

This high naphthene content is a distinguishing feature of the condensates of the fields indicated above. In this case there is a regularity for high-naphthene condensates--a prevalence of iso-paraffins.

Condensates separated from the gas caps of oil and gas-condensate fields of the Ob' area are characterized by high methane hydrocarbon content (80 per cent). It was established for these pools that the group composition of condensates through the pool profile is different and is in some regular relationship to the degree of remoteness of the oil margin. The aromatic hydrocarbon content in the condensates decreases as the distance from the oil pool increases and the role of methane hydrocarbons increases in them.

Condensates of Valanzhin pools of northern Tyumenskaya Oblast occupy the intermediate position and the group composition of the hydrocarbons varies over a wide range: the aromatic hydrocarbon content comprises 10-15 per cent, naphthene hydrocarbon content comprises 30-45 percent and methane hydrocarbon content comprises 45-55 percent. The iso- and n-paraffin ratio comprises 1:1.

The wide range of fluctuations is explained by the fact that some fields (Urengoy and Zapolyarnoye) are multi-bed types and most pools have oil margins. Since the condensates of different gas-condensate fields differ appreciably from each other in group hydrocarbon composition, the gasolines produced from them are also characterized by different motor grades (Table 1).

Table 1. Characteristics of Gasoline Fractions

Месторождение	Фракция н. к.—150° С								Фракция н. к.—200° С							
	Выход	Фракционный состав, °С				Октановое число			Выход	Фракционный состав, °С				Октановое число		
	на конденсат, % масс.	н. к.	10%	50%	90%	в чистом виде	г ТЭС на 1 кг топлива		на конденсат, % масс.	н. к.	10%	50%	90%	в чистом виде	г ТЭС на 1 кг топлива	
							0,41	0,82							0,41	0,82
Марковское	63	39	72	103	138	50,2	63,0	69,8	37,0	81	74	112	158	45,0	56,4	64,8
Шебелинское	58	45	68	105	138	63,0	69,0	71,0	74,0	49	72	106	166	59,0	66,0	71,0
Березанское	63	51	72	97	129	73,2	80,6	83,2	76,0	55	79	108	158	70,8	78,5	81,1
Усть-Вилюйское	82	40	62	93	126	73,6	81,0	83,8	90,0	45	76	104	148	72,0	79,5	82,0
Пунгинское	70	47	65	103	123	68,4	77,2	82,5	91,0	59	76	110	150	66,5	74,0	—
Уренгойское	65,8	42	72	103	132	66,0	73,1	—	79,4	47	78	113	160	60,8	68,2	73,1
Вуктыльское	52,7	44	77	105	139	54,8	65,4	71,0	68,8	51	79	114	167	50,7	60,4	66,7

Key:

1. Field
2. Markovskoye
3. Shebelinskoye
4. Berezanskoye
5. Ust'-Vilyuysk
6. Punginskoye
7. Urengoy
8. Vuktyl'skoye
9. Low-boiling fraction--150°C
10. Yield
11. Fractional composition, °C
12. Octane number
13. For condensate, percent by mass
14. Low-boiling
15. In pure form
16. Grams of tetraethyl lead per kilogram of fuel
17. Low-boiling fraction--200°C

Thus, for example, the gasoline fractions sampled up to 200°C from condensate of the Markovskoye field and containing primarily paraffin hydrocarbons of normal structure have an octane number of 45 in pure form and 65 with addition of 0.8 g/kg of TES [Tetraethyl lead]. Therefore, this fraction may only be a component of automobile gasoline or raw material for processes which permit one to increase the octane characteristic.

Gasolines whose composition contains an appreciable number of aromatic hydrocarbons along with paraffins are characterized by better antiknock properties. Thus, the fraction sampled up to 200° from condensates of the Shebelinskoye field has an octane number of 59 in pure form.

Gasolines containing a significant number of napthene and aromatic hydrocarbons simultaneously have high motor qualities. Gasolines sampled up to 200°C from condensates of the Maykop and Berezanskoye fields have an octane number of 68-71 in pure form and 76-78 with additive of 0.4 g/kg of TES, i.e., they correspond to gasoline of grade A-76.

It should also be noted that the octane numbers of gasolines produced from condensates of the same field, but different levels, may be different. Thus, for example, the octane number of gasoline fractions sampled up to 200° and that of condensate of the ninth horizon (Lower Cretaceous) of the Russkiy Khutor field is equal to 47, while that from condensate of horizon II (the Jurassic) of this same field is 66.5. This is explained by the aromatic hydrocarbon content in the second condensate.

The characteristics of gasolines produced from condensates of Siberian gas-condensate fields--Ust'-Vilyuysk and Punginskoye--are of great interest.

Gasolines produced from these condensates are characterized by good motor qualities. Thus, gasolines sampled up to 200°C (yield of 90 percent) from condensate of the Ust'-Vilyuysk field has an octane number of 72 in pure form and it increases to 79.5 with additive of 0.4 g/kg of TES, i.e., it corresponds to automobile gasolines A-66, A-72 and A-76. The relatively high octane number of gasolines produced from condensate of the Ust'-Vilyuysk field and the low temperature of their initial cytstallization (below -66°C) also permit production of V-70 aviation gasoline.

Despite the fact that paraffin hydrocarbons predominate in the gasoline sampled up to 200°C (yield of 91 percent) from condensate of the Punginskoye field and that the aromatic hydrocarbon content is only two percent, its octane number if comparatively high (66.5 in pure form). This is explained by the fact that the gasoline contains more isomer compounds amoung paraffin hydrocarbons.

However, it should be noted that gasolines produced from most of the investigated condensates consist of 40-60 percent of paraffin hydrocarbons. Therefore, the octane numbers of directly distilled gasolines produced from them are low.

Besides gasoline fractions, the condensates contain diesel fuel fractions (Table 2) whose yield fluctuates from nine percent (condensate of Punginskoye field) to 26 percent (condensate of the Vuktyl'skoye field). As indicated by investigations of the diesel fuel fractions, the aromatic hydrocarbon content in them is usually insignificant.

With regard to paraffin hydrocarbons, their content in the condensate increases as the boiling point of the fractions increases; therefore, these hydrocarbons are prevalent in diesel fuel fractions, which determines their high cetane number.

For the indicated reason, the diesel fuel fractions produced from condensates of most fields have high cetane numbers.

An exception are diesel fuel fractions produced from condensates in which the content of either naphthene hydrocarbons (condensate of the Ust'-Vilyuysk field) or that among paraffin hydrocarbons is greater than the isomer hydrocarbons (condensate of the Punginskoye field). It is natural that an additive which increases the cetane number should be introduced to these fractions to produce diesel fuel.

For diesel fuels produced from condensates (as for those produced from petroleums), the higher the cetane number, the higher turbidity and congealing temperature.

Thus, diesel fuel fractions of most condensates have comparatively high turbidity and congealing temperatures and can be used only during the summer season. Production of winter diesel fuels is related to deparaffinization of the corresponding fractions.

It should be noted that there are also condensates of some fields which boil off over a wide temperature range. After the diesel fuel has been sampled from these condensates, there still remain significant hydrocarbon residues.

The condensates of gas-condensate fields are also a good raw material for production of aromatic hydrocarbons from them. Condensates of the Central Asian fields, which are characterized by high aromatic hydrocarbon content (37 percent for Akkum, 32 percent for Uchkyr and 28 percent for Dalkhatyn), are promising for this purpose. Individual fractions of these gas condensates are characterized by an even higher aromatic hydrocarbon content. Thus, fractions of 60-95°C of condensates of the Akkum and Dengizkul' fields contain 51 and 34 percent aromatic hydrocarbons, respectively. From 30 to 41 percent aromatic hydrocarbons are contained in the fraction of 95-122°C of condensates from the Gazoi, Uchkyr, Kul'beshkak and Akkum fields. Beginning data permit one to consider highly aromatized gas condensates of Central Asia as raw material for production of aromatic hydrocarbons of composition C_6-C_8 from them.

Table 2. Characteristics of Diesel Fuel Fractions Sampled in the Temperature Range of 200°C--k. k.

Месторождение	Цетановое число	Фракционный состав, °С				ρ_4^{20}	$\nu_{ccт}^{20}$	Температура, °С			Выход на конденсат, %
		10%	50%	90%	96%			застывания	помутнения	вспышки	
Марковское	63	225	247	318	355	0,803	4,0	—22	—6	88	19,0
Шебелинское	58	215	238	287	306	0,807	4,2	—30	—13	82	26,0
Березанское	50	239	270	360	360	0,874	4,8	—2	15	90	24,0
Усть-Вилюйское	35	227	242	294	320	0,859	3,3	—	—60	79	10
Пунгинское	40	220	234	284	308	0,808	4,1	—38	—30	82	9
Уренгойское	53	232	257	339	355	0,828	—	—6	3	84	20,6
Вуктыльское	58	233	261	334	354	0,819	5,0	—6	3	84	26,0

Key:

1. Field
2. Markovskoye
3. Shebelinskoye
4. Berezanskoye
5. Ust'-Vilyuysk
6. Punginskoye
7. Urengoy
8. Vuktyl'skoye
9. Cetane number
10. Fractional composition, °C
11. Temperature, °C
12. Congealing
13. Turbidity
14. Flash point
15. Yield to condensate, percent

Thus, the main factor which determines the effectiveness of condensate refining is high light fraction content in it, which permits refining it into fuel or use of it as raw material for petrochemical synthesis.

6521
CSO: 1822

UDC 665.632

GAS AND GAS CONDENSATE REFINING IN THE UKRAINE

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 11-12

[Article by V. P. Maksimov, Ukraine All-Union Association for the Gas Industry]

[Text] The specific features of gas production in the Ukraine, the absence of discoveries of large gas fields recently in the republic, exploitation of pools mainly in the continuous and falling producting mode and finally the high requirements on the quality of the transported gas have advanced a number of problems and the need for a completely new approach to the problem of gas and condensate refining preparation before the Ukrgazprom Association [Ukraine All-Union Association for the Gas Industry].

The Ukrgazprom Association is exploiting 56 fields, 34 of which contain gas condensate in a volume of 4 to 530 g/m^3. Ninety per cent of the gas produced throughout the association comprises a product of gas-condensate fields. The gas from these fields usually has no toxic impurities other than carbon dioxide and organic acids whose content fluctuates from 2 to 5 percent by individual fields.

The gas produced in the Ukrainian SSR is used for production needs in the metallurgical and chemical sectors, the construction materials industry, as fuel at electric power plants, steam plants and for municipal-service needs; part of it is exported. The presence of qualified consumers in the internal gas consumption structure, introduction of a sector standard for gas delivered to main gas pipelines since October 1977 and also contract requirements for export deliveries of gas have lead to an increase in the level of its field preparation.

Gas is prepared at all gas-condensate fields of the Ukraine by the low-temperature separation scheme using the choke effect, which permits extraction of only C_4 hydrocarbons and above.

The variant of regional gas preparation at interfield pilot installations (MPGS) has been adopted by the Ukrgazprom Association to improve gas preparation for subsequent transport and more complete extraction of heavy hydrocarbons from the gas. The gas will be prepared here for a group of exploited fields.

MPGS includes both gas preparation installations with cooling machines and separator compressor stations. In this case the gas is prepared after it is compressed, i.e., at constant pressure equal to 45-55 kgf/cm^2.

Gas preparation by absorption methods without compression requires significant supercooling of the gas to achieve transport conditions and leads to significant metal and capital investments.

Thus, gas preparation at separation pressure of 15 kgf/cm^2 can be provided only at separation temperature not above -20°C. If one takes into account that the actual efficiency of the separation equipment is 95-98 percent, then supercooling of the gas compared to the required dew point temperature should be even lower, i.e., on the order of -25-30°C.

Reaching these temperature levels requires an increase in the output of the cooling machines and additional manufacture of special production equipment.

Moreover, the quality of gas preparation and productivity of the installation as a whole vary significantly during exploitation of fields with regard to variation of separation pressure and productivity of the installation at low pressures is reduced significantly, which also leads to an increase of metal consumption.

Gas preparation after compression ensures continuous operating mode of the production equipment for the entire period of exploitation of fields. Separation temperature will be minimum in this case (-10°C).

Technical documentation for construction of interfield pilot installations have now been worked out at points of concentrations of the main groups of gas-condensate fields being exploited:

--at the Krestishchenskoye field where gas from the Yefremovskoye, Kegichevskoye, Melikhovskoye, Krestishchenskoye, Sosnovskoye and Raspashnovskoye fields will be prepared;

--at the interfield GRS [Gas-distributing station] of the Solokhovskoye field--for preparation of gas from the Gadyachskoye, Kotelevskoye, Novotroitskoye, Oposhnyanskoye, Solokhovskoye, Timofeyevskoye and Bel'skoye fields;

--at the separator compressor station of Proletarskoye field--for preparation of gas from the Proletarskoye, Pereshepinskoye, Novoselovskoye, Vostochno-Novoselovskoye and Kremenovskoye fields.

Pilot installations are being put into operation this year at the Proletarskoye field and pilot installations will later be started at the Krestishchenskoye and Solokhovskoye fields.

Introducing all the interfield pilot installations into operation will permit the association to prepare all the gas at fields of the eastern oblasts of the Ukraine.

A large unitifed closed condensate collection and preparation system has been designed for the first time in the country at the association to utilize hydrocarbon fractions C_3 and C_4, driven off during gas preparation by the low-temperature separation scheme at the condensate stabilization stage in atmospheric containers.

It provides for transport of all the condensate from the fields of Khar'kovskaya and Poltavskaya Oblasts to the stabilization plant. A wide fraction and stable condensate will be produced here.

Gas extraction from the condensate is planned only up to 16 kgf/cm^2 in the fields by this scheme, while the gas driven off by means of ejector installations will be delivered to main gas pipelines.

The condensate stabilization installation will become operational at full capacity in 1980, which will essentially make it possible to eliminate all gas loses. The gas condensate is being refined at the Shebelinskoye Gas Refining Plant. Besides light petroleum products, since 1977 extraction of propane-butane fractions with production of commercial liquefied gas was begun during breakdown refining of the condensate. The condensate losses were reduced by 1.8 percent as a result of implementing this technique at the plant.

An important trend for increasing the efficiency of utilizing the gas condensate from fields of the Ukraine will be better refining of it to extract such valuable components for petrochemical synthesis as ethane, propane and so on. To to this, the association, jointly with the YuzhNIIgiprozgaz [Expansion unknown] has compied the technical-economic justification for construction of an ethane extraction plant in the main gas flow after the MPGS. Part of the gas will be refined at this plant with production of ethane, propane-butane fractions and stable gas condensate.

6521
CSO: 1822

UDC 665.633

GASOLINE PRODUCTION FROM GAS CONDENSATES

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 12-14

[Article by N. K. Yaremchuk, Poltava Gas Refining Administration]

[Text] Methaforming is the method of producing high-octane gasolines from condensate, developed by the Shebelinsk Gas Refining Plant. Its economy consists in the fact that it does not require the use of expensive catalysts, preliminary treatment of the raw material and other operations which increase operating expenses.

The extraction of gas condensate--an exceptionally valuable raw material for production of high-quality motor fuels and chemical products--has increased with an increase in the volume of gas production.

This determines the growth in the significance of technical and production decisions in problems of gas condensate refining.

For example, an increase of the octane number of gasoline by five points permits a saving of approximately four million rubles of operating expenses and up to ten million rubles of capital expenses per million tons of fuel consumed.

The chemical technology of the developed process is distinguished by the fact that thermal reforming of directly distilled gasoline is accomplished in the presence of natural gas, consisting of 95 percent methane, and therefore the process is called methaforming.

The process flow diagram of the methaforming process is presented in Figure 1. Gas condensate, being heated in the Kh-1, Kh-2 and T-5 heat exchanger system, is delivered to rectification column K-1 for stabilization. The light fractions are separated out here and are sent to the upper part of the column, cut off by a "blind" plate where they are mixed with methaforming products. Thus, they are not subjected to thermal refining at which only gas formation would increase and their octane number remains rather high.

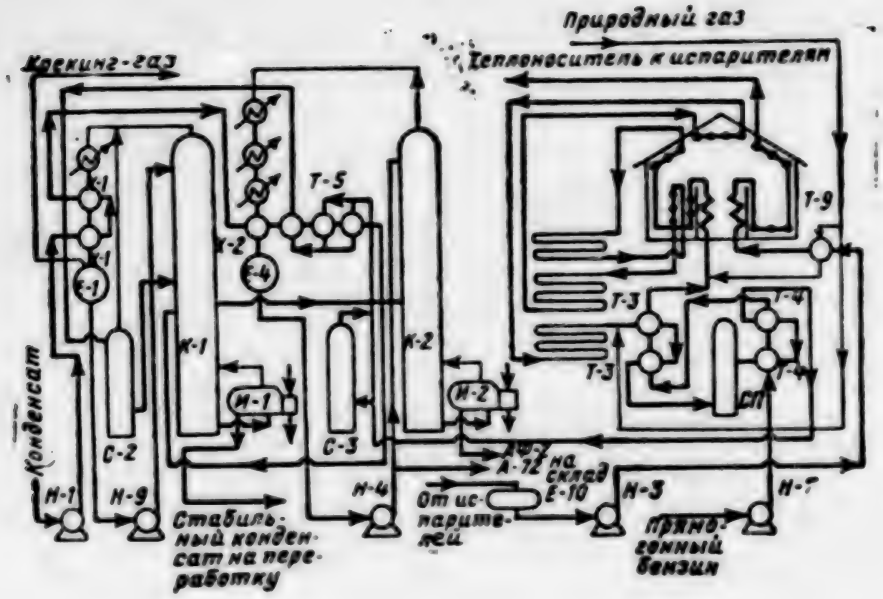


Figure 1. Process Flow Diagram of Industrial Methaforming Installation

Key:

1. Cracking gas
2. Natural gas
3. Heat carrier to evaporators
4. Condensate
5. Stable condensate for refining
6. From evaporators
7. To depot
8. Directly distilled gasoline

The stable condensate from the lower part of column K-1 is sent for separation into directly distilled gasoline, white spirit and diesel fuel.

The directly distilled gasoline, heated in heat exchangers T-4 and T-3 to 380°C, is mixed with natural gas, also heated in heat exchanger T-9, and is delivered to a tube furnace. The two-stage tube furnace is divided into two parts: the left side services the methaforming and the right side serves for heating the heat carrier.

The vapor-gas mixture with temperature of 545°C at the output from the furnace passes sequentially through three reaction chambers which are a coil of pipes of the same diameter as those in the furnace (152 mm) and each consisting of eight pipes 9 meters long.

The methaforming proceeds with negative thermal effect; therefore, the flow is returned to the furnace for intermediate heating after the first and second chambers. The chambers are installed so as to provide the necessary presence of the raw material in the reaction zone without reducing the productivity of the installation. A diagram of the temperature regime and the pressure drop along the length of the coil is presented in Figure 2. The vertical dashed line in the figure notes the beginning of the reaction zone.

The gas-liquid mixture, after separation of the coke and liquid and gaseous products in separators SP-2 and S-3, enters the upper part of column K-1, where it is stabilized and mixed with the light condensate fractions and then enters rectification column K-2 for separation. Commercial gasoline (low-boiling fraction of -150°C) is removed from the upper part of K-2 and flotation agent AF-2 is removed from the lower part.

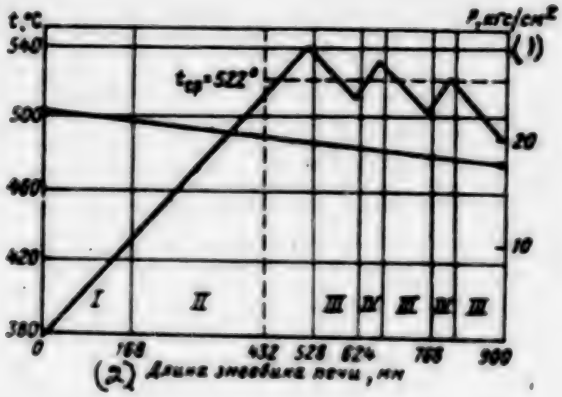


Figure 2. Graphs of Operating Mode of Industrial Methaforming Installation: coil sections: I--convection chamber of furnace; II--radiant chamber of furnace; III--portable reaction chambers; IV--intermediate heating sections

Key:
1. kgf/cm^2
2. Length of furnace coil, mm

The methaforming gases emerging from K-1 and S-2 previously entered the fuel system of the plant and the customers, but are now used to produce liquefied gas and dry fuel gas.

The material balance of the methaforming plant is characterized by the following data (in percent by mass):

Raw material (directly distilled gasoline) loaded	100
Produced:	
high-octane gasoline	84.5
flotation agent AF-2	6.0
methaforming gas	9.0
coke plus losses	0.5

The surplus natural gas delivered to the installation is not included in the material balance.

Besides reconstruction of the reaction subassembly, separators, cold raw material heat exchangers T-3 and T-4 and also subassemblies for adding

alkali to the commercial gasoline to purify it of hydrogen sulfide and a subassembly for mechanized delivery of antioxidant to the commercial gasoline pipeline were also installed during introduction of the methaforming process as the Shebelinsk GPZ.

Industrial tests of the process made possible an important conclusion about the characteristics of coking. Coke is formed in considerably smaller quantities during methaforming than during thermal reforming. Subsequent prolonged operation of the installation showed that cleaning of the reaction coil pipelines is essentially not required--the pipes have not required cleaning once during six years of operation.

A decrease of the number of coke deposits during methaforming is explained by the effect of two factors:

--by suppression of coking reactions by the surplus methane of the natural gas (by approximately 89 percent) and

--by an increase of the degree of flow turbulization by this same natural gas (by 11 percent).

The structural nature of the coke was also changed: whereas it previously settled on the pipes in a dense mass, difficult to clean, during methaforming it acquired the nature of finely dispersed particles easily removed in separators SP and S-3.

A-72 and A-76 gasoline, which meets the needs of GOST [State Standard] by all indicators, is produced by the methaforming method at industrial installations of the Shebelinskoye GPZ.

Besides commercial gasoline, an effective flotation agent AF-2 which meets the requirements of specifications and is used for flotation of coking coal at all coke-enrichment plants of the Donbass and which may also be used as a component of winter diesel fuel, is produced due to introduction of methaforming. Liquefied gas which is used extensively by consumers is produced on the basis of methaforming gas.

Methaforming is a purely thermal process and does not require the use of expensive catalysts, preliminary cleaning of the raw material and so on--operations which increase operating expenses. The use of methaforming in the immediate vicinity of the gas fields also frees enterprises of the need to construct compressor stations to maintain gas pressure.

The enumerated factors ensure very low cost of high-octane gasoline produced at the Shebelinsk GPZ compared to other plants of the country. The saving from introduction of methaforming comprises 15 rubles per ton of commercial gasoline produced.

The process of methaforming of directly distilled gasolines from gas condensate raw material may find wide application at some small installations and gas refining plants of the country operating by the fuel scheme. Its advantages are especially obvious when developing individual large gas condensate fields recently being exploited.

The principle of introducing the process under excess methane pressure (natural or casing-head gas) may also be used extensively at petroleum refining plants to reduce coking during such processes as thermal cracking of petroleum residues.

Natural gas can be used by the methaforming principle during thermal pyrolysis instead of steam, which permits an increase of the yield of valuable products, a reduction of coking and improvement of the technical-economic indicators of the process as a whole.

6521
CSO: 1822

UDC 553.981:622.001

THE SOUTHERN CASPIAN AS AN INDEPENDENT GAS-BEARING REGION

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 24-27

[Article by G. P. Tamrazyan and S. T. Ovnatanov, VNIIOENG]

[Text] Available data indicate the significance of the Southern Caspian Depression as an important independent hydrocarbon gas-bearing region with possible discovery of large and gigantic gas fields in it.

The opinion has long existed about an increase of gas content downward as the regional structure submerges, about a gradual replacement of oil pools by gas and gas condensate pools, about zones of prevalent gas and oil accumulation and so on. The idea of gradual replacement of liquid hydrocarbons by gaseous hydrocarbons has long existed in science. If there is gradual replacement of oil pools by gas pools, then there should exist in nature significant overlap zones and zones of the joint presence of large quantities of oil and gas where one and the other coexist with each other in different ratios, in irregular order and so on. Hence, it follows that a significant part of gas resources can be found in oil- and gas-bearing regions.

Moreover, the practice of geological prospecting work and exploitation of oil and gas pools shows that the largest gas fields are separated from oil pools by a significant distance, the gas accumulation zones do not coincide with the oil accumulation zones, having their own areas of distribution, while the gas available in oil fields comprises only a small part of the total balance of the earth's gas resources. "Gas and gas-condensate fields and gas pools of fields consisting of alternating oil and gas pools comprise 96.1 percent of the proven gas reserves and only 3.9 percent of oil-related reserves, i.e., they are located on the gas caps of oil fields. These data indicate that the main part of the natural gas resources in the interior are spatially separated from the oil and, therefore, expiration and prospecting for new gas fields can be carried out regardless of the distribution of oil resources" [1]. It is difficult to overestimate this important proposition.

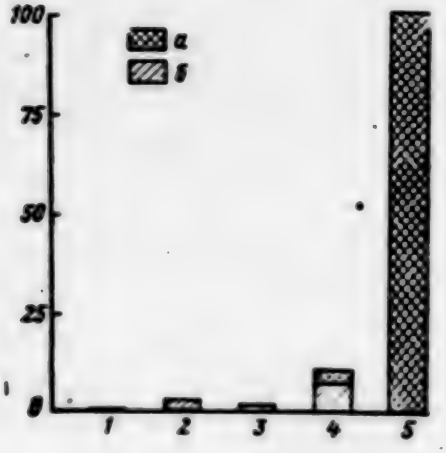


Figure 1. Variation of Free (a) and Related (b) Gas Resources Along the Submergence of the Fat'mai-Zykh-Makarovo Anticlinal Zone: Along the vertical--gas resources (in arbitrary units); along the horizontal--fields: 1--Balakhano-Sabunchi-Ramaninskoye; 2--Surakhanskoye; 3--Karachukhur-Zykhskoye; 4--Peschanyy-more; 5--Bakhar.

If only four percent of all gas resources can be attributed to the gas caps of oil fields, then the distribution characteristics of related gas (gas caps) can hardly be explained with regard to the disposition of free gas. Consequently, this proposition is related more to casing-head gas.

Variation of the ratio of gas to oil resources in the fields of the Apsheron Peninsula and Archipelago as the overall regional structure of submergence of the oil- and gas-intrusive productive mass increases, was considered previously. This analysis was usually carried out on the basis of taking into account all gas resources (free, related and casing-head) simultaneously and also frequently with accounting for extracted hydrocarbon resources only. It is better to consider free gas separately from related and casing-head gas for universally acceptable analysis and not to consider unextracted reserves, but balanced resources. This analysis showed the following. The ratio of gas to oil resources frequently varies slightly for many fields of Apsheronskaya Oblast. Thus, for example, this ratio increases only 1.5-2-fold from the Darwin Bank Uplift through the uplifts of Artem and Zhiloy islands to the merged Gryazevaya sopka-Neftyanyye Kamni Uplift. The pattern is different in the Fat'mai-Zykh-Makarovo anticlinal zone, the only zone of the peninsula which extends toward the deepwater basin of the southern Caspian. An even more significant increase of the ratio of gas to oil resources is noted in this zone, lying northwest of the Fat'mai Uplift through the entire Apsheron Peninsula and proceeding further in a southerly direction through the Peschanyy-more and Makarovo (Bakhar) Uplifts. It is interesting in this case that this ratio varies slightly with respect to casing-head gas, whereas it varies more significantly along this anticlinal zone with respect to bound gas, but

without any clear direction (the maximums of this ratio are confined to the Surakhanskoye and Peschanyy-more fields).

A more interesting pattern is observed in free gas distribution (Figure 1). There is no free gas in the majority of fields of the Apsheron Peninsula and easterly of the located fields. It is found on the entire Apsheron Peninsula only in two fields (Karadag and Zyrya), located in the extreme south of the peninsula, while a significant part of the southern limbs of the intrusive structures is found within the sea. Free gas appears in the southern part within the offshore territory of the Fat'mai-Zykh-Makarovo anticlinal zone. The free gas resources are insignificant within the Peschanyy-more field, but increase 20-30-fold or more in the Bakhar field. Thus, the free gas resources in the southern part of the anticlinal zone toward the southern trough of the Caspian increases sharply near the Peschanyy-more field, rather than gradually and especially south of it in the Bakhar field.

Considerable free gas resources have been determined south of the Apsheron Peninsula and in other offshore fields, related geographically to the Baku Archipelago (Sangachaly-more, Duvannyy-more, Bulla Island and Bulla-more), where the gas resources are related primarily to the same category of fields as the resources of the Karadag field.

Considering as a whole the features of free gas distribution in the northwestern part of the Southern Caspian Depression, one can conclude that the central part of the latter is an independent gas-bearing region in which there are enormous extended anticlinal structures (Figure 2), while the fields determined on the Apsheron Peninsula and in the shallow part of the sea are located in the more boundary part of this gas-bearing region, whose contours have twisted outlines, seemingly following the regional structural bending. The northwestern part of this gas-bearing region is shown in Figure 2. The Karadag, Peschenyy-more, Zyrinskoye and Southern oil and gas-condensate fields in the north and Sangachaly-more, Duvannyy-more, Bulla Island and Bulla-more in the northwest are located in its outer belt. The transition from the outer belt to the main (inner) part of the gas-bearing region occurs near the Bakhar and Bulla-more fields in the northwest. Such highly promising structures as, for example, Shakhovo-more and Andreyev bank are located in this inner part of the Southern Caspian gas-bearing region [2]. It is presently difficult to determine how the outer belt of the gas-bearing region passes in the west. However, it is clear that there are significant gas accumulations west of it as well, which is indicated by the intensive eruptions of gas-mud volcanos within the Baku Archipelago and nothwesterly of it.

The southern submergence of the Fat'mai-Zykh-Makarovo anticlinal zone, passing through the large Shakhovo-more, imeni Vezirov, imeni Azizbekov, imeni Koganov and other uplifts, has already been specifically located within the independent high gas-bearing region of the Southern Caspian. The extent of the structures is significant here (up to 35-65 km) and they, representing

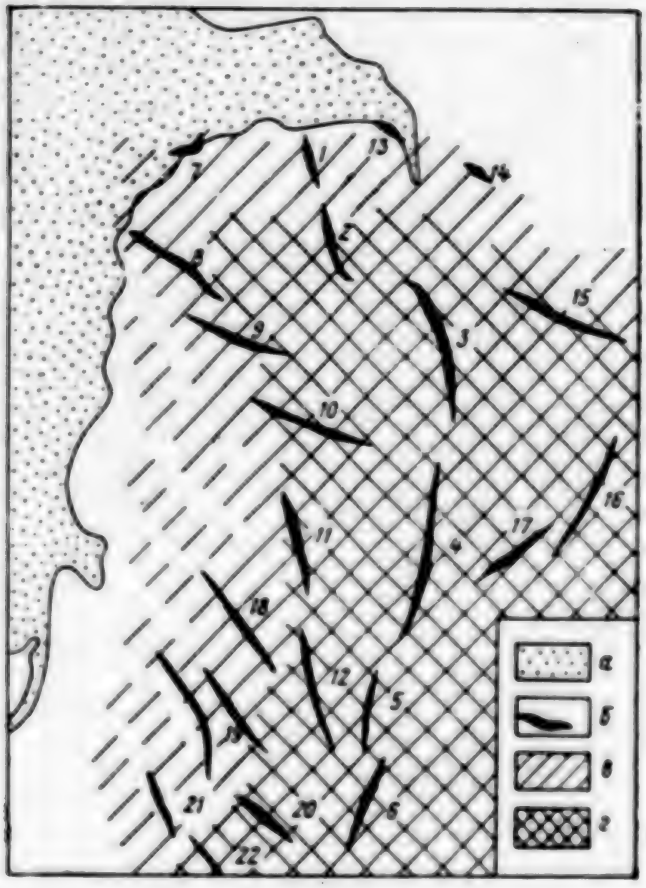


Figure 2. Southern Caspian Depression (Northwestern Part) and Zones of Probable High Gas Content:
a--land; b--anticlinal uplifts (uplifts of the Baku Archipelago are omitted, with rare exceptions); c--outer zone of high gas content (the boundary is problematical in the west); d--probable location of fields with enormous gas resources. Uplifts: 1--Peschanyy-more; 2--Makarovo (Bakhar); 3--Shakhovo-more; 4--imeni Vezirov; 5--imeni Azizbekov; 6--imeni Koganov; 7--Karadag; 8--Sangachaly-more, Duvanyy-more and Bulla Island; 9--Bulla-more; 10--Andreyev bank; 11--imeni Fioletov; 12--imeni Dzhaparidze; 13--Zyrinskoye; 14--Southern; 15--imeni Zevin-Petrov; 16--imeni Amiryan; 17--imeni Solntsev; 18--Kalmychkov bank; 19--group of Broisov uplift and uplifts imeni Shaumyan and imeni Bogdanov; 20--imeni Osepyan; 21--imeni Polukhin; 22--imeni Metaks.

enormous reservoirs for hydrocarbon accumulation and being located in the zone of probable distribution of gas pools, undoubtedly contain significant gas resources. Incidentally, we noted previously [3] that the gas resources for the Shakhovo uplift comprise approximately one-half trillion cubic meters and this is also the category of large and gigantic fields. Other enormous structures determined by seismic prospecting are located adjacent to the Shakhovo-more, imeni Vezirov and imeni Azizbekov anticlinal

structures. We noted already [2] that one of the promising uplifts is the Andreyev, differing advantageously from all the other uplifts of the Baku Archipelago by the fact that it has the aggregate of data which are very favorable for high estimates of gas and oil content. This situation permitted us to conclude that the uplift is one of the most promising gas and oil fields which should be prospected as soon as possible [2].

Such highly promising uplifts as those imeni Zevin-Petrov, imeni Amiryan, imeni Solntsev and others are located within the given diagram (see Figure 2) east of the remote southern continuation of the Pat'mai-Zykh-Makarovo anticlinal zone, extending for 200 km in the southerly direction (through the deepwater sections of the Caspian). Likes those considered above, all these structures of ancient deposition and with respect to their own paleotectonic development were gas-accumulation zones (and sometimes pr[illegible]bly oil-accumulation zones). The formation of large gas accumulations was possible in these Pliocene uplifts which developed for a long time. They and the other relatively shallow uplifts of the Southern Caspian Depression are an integral link in the region of large gas fields, the scale of which has not yet been adequately imagined. An independent gas-bearing region with large gas fields and enormous free gas resources is located in this depression [4].

The considered data permit one to direct attention toward intensification of exploring the most promising structures in the Southern Caspian Depression and accelerating the geological prospecting work and exploitation of the gas fields of the Southern Caspian, which will undoubtedly provide a large increase of the gas reserves since the potential capabilities of this region are very high.

BIBLIOGRAPHY

1. "Zazovye i gazokondensatnye mestorozhdeniya. Spravochnik" [Gas and Gas-Condensate Fields. Handbook], Moscow, Nedra, 1975.

2. Tamrazyan, G. P. and S. T. Ovnatanov, "Promising Gas-Bearing Areas of the Southern Apsheron Basin," GAZOVAYA PROMYSHLENNOST', No 9, 1976.

3. Tamrazyan, G. P. and S. T. Ovnatanov, "Cryptofracture Zones in the Southern Apsheron Basin (Southern Caspian Depression)," DOKL. AN SSSR Vol 125, 1974.

4. Tamrazyan, G. P., "One Important Feature of the Structure of the Southern Caspian Depression," DOKL. AN SSSR, Vol 131, No 4, 1960.

6521
CSO: 1822

UDC 621.643.002

DIFFICULTIES OVERCOME IN AMMONIA PIPELINE CONSTRUCTION

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 11, Nov 79 p 29

[Article by N. G. Yurchishkin, Trust Ukrvostokneftegazstroy, Poltava, in the column "Exchange of Production Experience": Construction of Ammonia Pipeline on Worked Territories"]

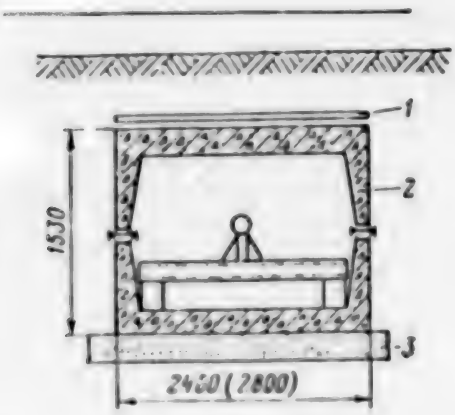
[Text] The supply ammonia pipeline Gorlovka-Panyutino extending 212 km is being connected to the main ammonia pipeline Tol'yatti-Odessa extending 1589 km. On the segment of the route of the supply ammonia pipeline about 8 km long the pipeline passes on worked territories.

Since the experience of planning and construction of the ammonia pipelines on the worked territories is lacking it was necessary to develop special recommendations that take into consideration the specific nature of the transported product of high toxicity, and the specific nature of the work of the ammonia pipeline under conditions of worker territories.

Such recommendations were made in the institute PromstroyNIIproyekt [All-Union Planning and Scientific Research Institute of Industrial Construction] (Donetsk). The institute Giprotruboprovod [State Order of Red Banner of Labor Institute for Planning Trunk Pipelines] made a draft linear segment of the ammonia pipeline according to them.

The expected shifts and deformations (stretching and compression) in the earth's surface were computed. It was provided that the ammonia pipeline be protected on the principle of pliability which suggests the splitting of the pipeline into sections restricted by expansion pieces. Such a system makes it possible to move individual sections with the shifting ground as a result of the work of the expansion pieces. The length of the sections is 250-600 m. To avoid installation of additional expansion pieces for the first time in the practice of planning and construction on the worked territories some of them were given pre-stress-compression in the stretching zone of the earth's surface, and in the zone of compression preliminary stress-stretch.

In order to exclude the effect of vertical and horizontal forces of the shifting ground the pipeline was laid in semi-through channels (see figure) assembled from individual components. They provided for special supports which guarantee the longitudinal movement on straight segments of the expansion piece, and free movement on bent. The support design guarantees slipping of the sheet of stainless steel on the fluoroplastic, thanks to which the requiredreaction of the pipeline to the ground movement is attained.



Scheme of Channels Suggested by Builders

Key:
1. two layers of bitumen
2. trough L-21 (L-24)
3. sandy preparation

The expansion pieces were made of pipes 273 mm in diameter, with wall 12.7 mm thick assembled from installation blanks that can be bent in the cold state on pipe-bending machines.

The ammonia pipeline in the channels extends 3.2 km.

After studying the draft the builders suggested a number of measures which made it possible to considerably reduce the labor intensity of the work, improve the quality, and save over 30 T of reinforcing steel.

The trough segment of the ammonia pipeline was constructed according to the draft developed by the trust Orgtekhstroy by the line method. Especial attention was focused on the accuracy of the geodetic subdivisions at all stages of construction. The expansion piece was welded on a preliminarily leveled platform on wooden foot boards. On it a mold was made with whose help the axis of the trough (pipeline) was marked off in the trenches at the site. The troughs were assembled by a K-161 crane. The lower troughs

were installed on the prepared base, then on the foot boards in then the expansion piece was installed. After this the troughs were straightened with respect to the pipeline. Then the upper troughs were installed, a layer of hydro-insulation was applied, and it was filled in.

Experience has demonstrated that the expansion piece after installation on the sliding supports somewhat alters its geometric dimensions. Apparently, this is induced by errors in the subdivisions, as well as by the change in the shape of the pipeline as a result of the removal of the inner stresses after transfer and its installation on the sliding supports in the troughs.

Since the length of the expansion piece reaches 100 m, movements or deviations from the axis in three troughs were impermissible at several points. This induced a shift in the troughs by the magnitude of deviation.

A certificate of latent work was compiled for the finally installed and adjusted expansion piece, after which its ends were welded to the main branch. Here the strainable expansion pieces were welded to the ends of the pipe lengths no less than 60 m long. The designs were pre-stressed by drawing the pipe length out with a pipe layer with special attachment for seizing the pipe. The movement was also fixed and certificates were compiled for latent work.

It should be noted that the draft of the trough segment had a number of shortcomings. The draft did not provide for the possibility of the trench filling with subsoil water; reliable flexible hydro-insulation for the troughs was not developed, and the supports were not completely successful. Nevertheless, the fulfilled work to erect protective structures for the ammonia pipeline yielded a significant effect.

Good indices in the construction of the supply ammonia pipeline were achieved by the brigades of P. S. Shtilenko, I. D. Ivanov (SU-13 of the trust Ukrvostoknaftegazstroy), I. A. Gol'tsov and V. A. Ul'yanov (SU-12) and the excavators of SUM-17 A. I. Shumskiy and I V. Shevchenko, and others.

9035
CSO: 1822

UDC 621.643.002.2

OPENING-TYPE ANCHOR USED TO SECURE PIPELINES

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 11, Nov 79 pp 16-18

[Article by V. V. Postnikov, A. S. Trofimov, Glavsibtruboprovodstroy, Tyumen', and I. V. Kulikov, Academician I. M. Gubkin Moscow Institute of the Petrochemical and Gas Industry, Moscow, in the column "Construction in West Siberia": "Securing of Pipelines with Opening-Type Anchors"]

[Text] Anchors of the opening type have been widely used in the construction of trunk pipelines in West Siberia. Such anchors as compared to the fired and screw types have considerable advantages. Their retaining force in comparable ground conditions is 5-10 times greater than the screw type, and 15-20 times greater than the fired type. The use of opening anchors makes it possible to increase the spacing of their arrangement, and consequently, to increase the labor productivity during laying of the pipelines.

Securing pipelines with opening anchors includes two technological operations: driving the anchors to the planned mark and bringing them into the working position, complete opening of the blades with application of the extracting load.

The anchors can be driven in by series pile-driving machines (SP-49, S-870 and others). Opening of the blades requires the application of a considerable (up to 60 ton-force) extracting load. Powerful pipe layers are used in this operation.

The reach of the pile-driving equipment is limited in the mobile pile-driving units according to the conditions of stability. Currently the solution of the following tasks is important: guarantee of the possible use of pile-driving machines with short reach of the pile-driving equipment; creation of special machines to drive in the anchors to a level that is located below the bearing surface with considerable (up to 5 m) distance of the driving-in point from the base of the machine.

According to the technical assignment of Glavsibtruboprovodstroy [Main Administration for Construction of Petroleum Pipelines and Pipelines in the Regions of Siberia] the MPA1 machine has been developed to submerge the

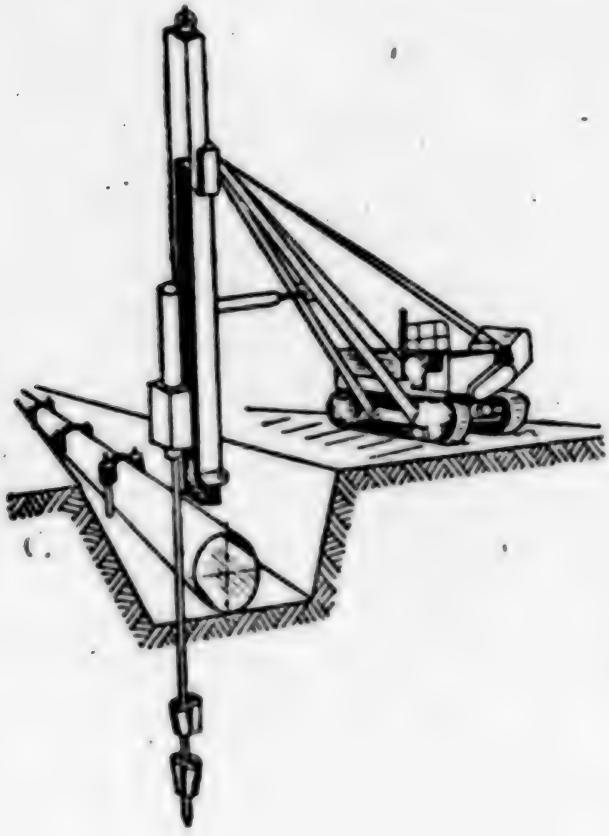


Figure 1. Overall View of MPA1 Machine for Submerging Anchors

AR-401 anchors. The machine (figure 1) is pile-driving equipment of the telescopic type suspended on a base machine with maximum reach of the submerged device 6.5 m. In the working position the machine is 5.4 m long, 4.5 m wide and 8.8 m tall, which makes it possible to easily move it under route conditions.

The MKA-1 machine is designed to carry out two operations (driving in and opening) on one (installation) side of the pipeline from its theoretical axis.

Several technological plans have been developed that are rated for the use of series pile-driving equipment. The common idea uniting these plans consists of the closest possible convergence of the machine stand to the point of driving in.

This condition is guaranteed relatively simply for the anchor located between the installation zone and the theoretical axis of the pipeline (figure 2). But for driving in the distant anchor it is necessary to look for special techniques.

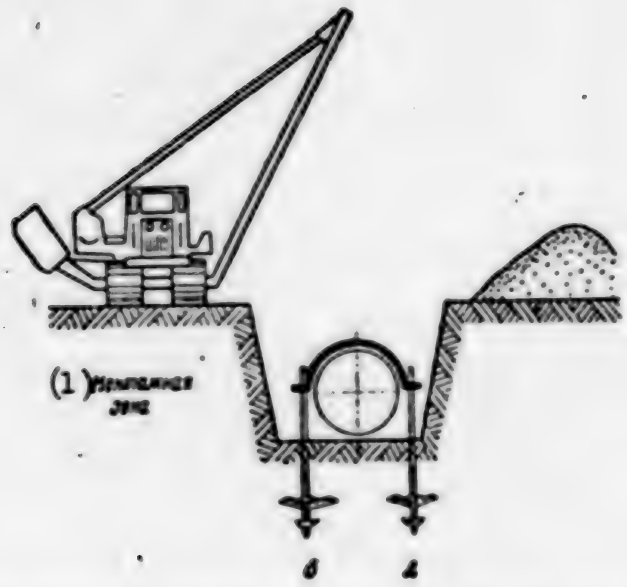


Figure 2. Anchors Near to Installation Zone and Far in Anchor Device (Respectively "б" and "А"). 1. Installation zone

At first glance it seems expedient to clean the area from earth heaps in the zone of excavation and earth moving, and after moving the equipment across the connecting strip to the distant edge to carry out driving in and opening. However the work from both sides of the pipeline axis is linked to the additional movement of frozen moisture-saturated soil masses which results in a sharp decrease in the rate of construction. This technological [words illegible].

Another solution consists of the arrangement of the pile-driving aggregates transverse to the axis of the pipeline on the connecting piece. Driving in of the anchors from the connecting piece (bridge) was suggested by the developers of the method for securing with opening-type anchors (Glavsibtruboprovodstroy, I. M. Gubkin Moscow Institute of the Petrochemical and Gas Industry, Tyumen' branch of the special design office "Gazstroymashina", and VNIIST [All-Union Scientific Research Institute for the Construction of Trunk Pipelines]). During the practical realization of this method the group of specialists from the trust Severtruboprovodstroy suggested using for arrangement of the connecting piece a reinforced concrete overweight (Shabanov, P. P., Doroshenko, I. G., Mashevskiy, V. A. "Use of AR-401 Opening-Type Anchors for Ballasting Pipelines," STROITEL'STVO TRUBOPROVODOV, No 12, 1978).

The third solution is extensive combination of the operations for working out a trench (Pt), laying the pipeline in it (Y), driving in the anchors (З) and opening their blades (Р).

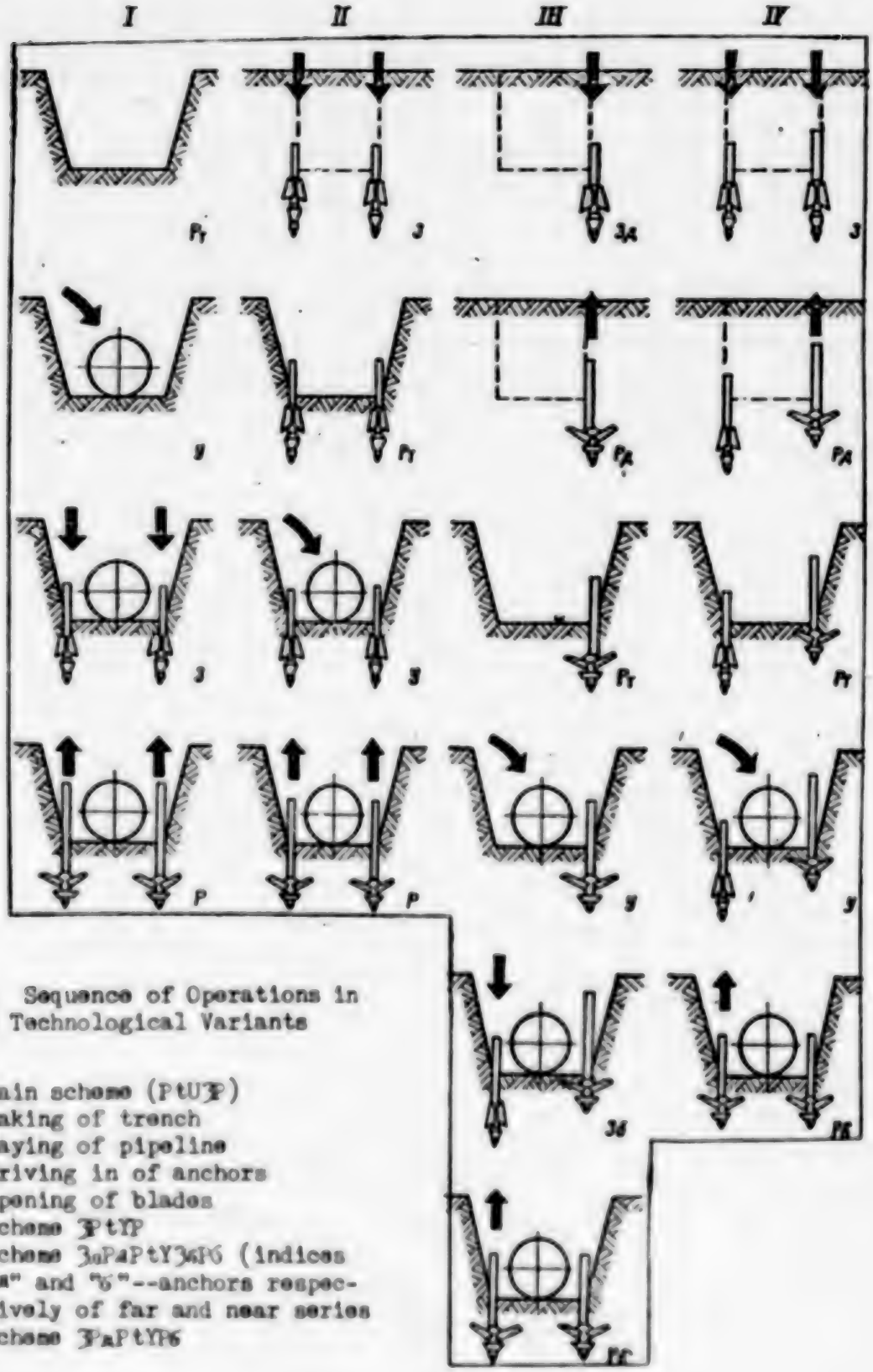


Figure 3. Sequence of Operations in Different Technological Variants

Key:
I. main scheme (PtUЗP)
Pt. making of trench
Y. laying of pipeline
З. driving in of anchors
P. opening of blades
II. scheme ЗPtYP
III. scheme ЗаPаPtYЗбPб (indices "а" and "б"--anchors respectively of far and near series
IV. scheme ЗPаPtYPб

If we designate the main scheme by the letters of the operations PtYЗP (figure 3, scheme I) then the variants of combination can be represented by the following schemes.

Scheme II (ЗPtYP) consists of the advance driving in of anchors at previously marked points before formation of the trench. The scheme was suggested by the trust Orgtekhtruboprovodstroy at the branch school for securing of pipelines by opening anchors of the AR-401 type.

Scheme III (ЗаРгPtYЗбРб) is based on separation of the operation into driving in and opening individually for the far (index "а") and near (index "б") series of anchors. Since the main difficulties are linked to the driving in and opening of the far anchors it is expedient to fulfill precisely these operations before the formation of the trench. Here the driving in and opening of the near series of anchors are carried out after formation of the trench and laying of the pipeline.

A combination of operations is possible according to scheme IV (ЗРгPtYРб) when the driving in of both series is ahead of the trench digging, while preliminary opening is provided only on the far series of anchors. The near anchors are brought into the working position only after laying of the pipeline.

It should be noted that under complex natural conditions of West Siberia the effectiveness of the technological solutions is determined a great deal by the level of autonomy, i.e., the degree of independence of one technological operation from the other. The higher the autonomy the greater the probability of successful fulfillment of the operation since the possibility of a negative effect of malfunctions in the related technological links is reduced.

Pile-driving and excavating machines under West Siberian conditions have a low coefficienct of availability therefore it is justified to strive if possible not to use the technology in which the work to dig trenches and drive in anchors is strictly linked to time.

The schemes of advance driving in (II, III, IV) from this viewpoint are the most efficient.

The ratio of the duration of the operations for opening and driving in equals 1:5, therefore the pipe layer that is included in the set of machines for securing of anchors is not used efficiently for the greater part of the time. Technological schemes II, III and IV make it possible to provide for the use for driving in the anchors of a pipe layer that is sent for a certain time from the nearest production links.

Schemes II and IV are mainly suitable on sections where the trench is made by a rotary excavator. On the sections where payloaders are operating, and in particular on sections of horizontal angles of rotation with increased width of the trench only scheme III is applicable.

During work according to schemes II and IV the danger arises of damaging the pipe wall and the insulation coating on the anchor probe. Scheme III excludes this danger and therefore is the most preferable.

The use of the indicated technological schemes makes it possible to a sufficient measure to guarantee the required rates of securing pipelines with AR-401 opening anchors, effectively employing here the extant and special equipment.

9035
CSO: 1822

UDC 665.52

ANALYSIS OF LOSSES OF PETROLEUM PRODUCTS IN HIGH-OUTPUT OIL REFINING PLANTS

Kiev NEFTYANAYA I GAZOVAYA PROMYSHLENNOST' in Russian No 4, Oct-Dec 79 pp 28-30

[Article by G.P. Pikalov and A.D. Rudkovskiy, SevKavNIIgaz [Northern Caucasus Scientific Research Institute of Gas] and Novopolotsk NPZ [Oil Refining Plant]]

[Text] For the purpose of analyzing losses were used statistical data for the period of operation from the base year to 1974 inclusive, on five of the largest-capacity plants of the ELOU-AT and ELOU-AVT type at three oil refining plants (NPZ's) which reached the planned figures and higher.

First was analyzed the operation of each plant, and then of a group of plants in terms of their years of operation (tables 1 and 2).

An analysis of the data presented in tables 1 and 2 makes it possible to note that together with an increase in the capacity of plants, the indicator of which is a function of two quantities--the performance of the equipment and its utilization over time--the absolute and relative losses for the period studied were reduced respectively by 0.35 and 0.80 percent and to 0.48 and 1.30 percent in terms of crude.

The reduction in losses was accomplished mainly on account of the efficiency of the technological layouts and intensification of the operation of plants.

Know-how gained in the operation of plants demonstrated the feasibility of a topping column operating mode with maximum extraction of the gas-and-benzine mixture. In actual operation the depth of extraction of benzine fractions in the topping column is considerably greater and the losses lower than the planned.

The introduction in high-ouput oil refining plants of a new method of recovering light hydrocarbons completely eliminates the expensive layout system for collecting and compressing gases and along with improved extraction of benzine makes possible practically total condensation of the

propane-butane fraction contained in the oil, and also facilitates the extraction from the oil of liquefied gas, which is testified to by the high quality of the stable benzine. The efficiency of the design layout has totally eliminated the discharge of gas from the atmospheric unit to the burner jet and has increased the potential of the yield of liquefied gas in the stabilization unit to one percent of the oil versus 0.5 percent as planned.

Table 1. Dynamics of Losses of Oil and Petroleum Products in High-Output Oil Refining Plants in Terms of Years of Operation

1) Показатели	2) Годы эксплуатации						
	1	2	3	4	5	6	7
	3) Количество установок						
	5	5	5	5	4	3	1
4) Деэмульгатор							
5) расход деэмульгатора, г/т	26.0	26,0	24,4	26,5	23,0	20.7	16,0
6) расход промывочной воды на нефть, %	5,2	6,0	6,8	8,2	7,3	6,0	7,0
7) Нефть сырая							
8) плотность, ρ_4^{20}	0,863	0,861	0,861	0,861	0,861	0,862	0,864
9) вода, %	1,4	1,0	1,2	1,0	1,3	1,7	1,8
10) соли, мг/л	1000	1000	920	790	720	650	37
11) Нефть обессоленная							
12) вода, %	0 16	0,16	0,14	0,16	0,11	0,10	0,02
13) соли, мг/л	17,50	13,00	10,00	7,80	7,20	3,40	2,00
14) глубина обессоливания, %	98,20	98,70	98,90	99,00	99,00	99,40	94,60
15) Фактические потери, %							
16) блок ЭЛОУ	1,25	0,92	0,70	0,54	0,50	0,40	0,35
17) установка	3,00	2,20	1,85	1,36	1,10	0,85	0,52

Key:

1. Indicators
2. Years of operation
3. Number of plants
4. Demulsifying reagent
5. Consumption of demulsifying reagent, g/t
6. Consumption of washing water for oil, %
7. Crude oil
8. Density, ρ_4^{20}
9. Water, %
10. Salts, mg/l
11. Desalted oil
12. Water, %
13. Salts, mg/l
14. Depth of desalting, %
15. Actual losses, %
16. ELOU unit
17. Plant

Table 2. Dynamics of Losses of Oil and Petroleum Products in High-Output Oil Refining Plants for the Period Studied

1) Индекс НПЗ	2) Тип установки	3) Срок эксплуатации, годы	4) Объем переработки, % к проекту		5) Время работы оборудования, сут		6) Потери при переработке, %		7) Снижение абсолютных потерь, %	
			8) Годы							
			9) базовый	1974	базовый	1974	базовый	1974	10) блок ЭЛОУ	11) установка
1	12) ЭЛОУ-АТ	7	86,5	143,0	302,5	365	2,80	0,52	0,65	0,77
1	13) ЭЛОУ-АВТ	5	63,3	119,0	236,0	340	2,10	0,45	0,50	0,80
2	ЭЛОУ-АТ	6	57,8	102,5	192,0	340	3,80	1,10	0,60	0,70
2	ЭЛОУ-АВТ	3	70,0	114,0	194,0	350	2,00	1,30	0,30	0,35
3	ЭЛОУ-АТ	6	51,4	119,0	216,5	353	2,70	0,60	0,63	0,78

Key:

1. NPZ index
2. Type of plant
3. Period of operation, years
4. Amount of processing, percentage of planned
5. Operating period of equipment, 24-h periods
6. Losses in refining, %
7. Reduction in absolute losses, %
8. Years
9. Base
10. ELOU unit
11. Plant
12. ELOU-AT
13. ELOU-AVT

The employment in the layout of surface condensers instead of atmospheric condensers in the vacuum unit has considerably reduced losses of petroleum products from plants with discharge water with a high concentration of hydrogen sulfide.

The VNIIPIneft' [expansion unknown] Institute in conjunction with the Polotsk NPZ has developed and introduced in high-output oil refining plants a technology for utilizing the waste water for the purpose of washing off salts in the crude, which has made it possible to eliminate the need for an ELOU [electric desalination unit] unit employing circulating water and has prevented losses of white oils from the plant along with the discharge water by recycling them for refining, bypassing a complex of purification facilities and a circulating water supply.

Intensification of the work of the ELOU by improving the efficiency of electric desalination has made it possible to finish the process of the thorough desalination of oil, as the result of which has been achieved high quality of the desalinized oil with a chloride content of 2 to 5 mg/l, which has prevented unscheduled shutdowns of plants because of corrosion of

the equipment, has lengthened the run between repairs of plants to exceed that planned (365 versus 340) and has reduced the losses of oil and petroleum products associated with this (cf. table 2).

It should be mentioned that the quality of the oil arriving for refining has been improved. For example, in high-output plants of index-1 NPZ's was processed a mixture of oil predesalinized in an electric field from the "Druzhba" [Friendship] Oil Pipeline and of Belorussian crude oil in a ratio of 4:1. The mean content of salts in the original mixture was not greater than 500 mg/l in the base year, and equaled 37 mg/l in 1974. Arriving at high-output plants of the other two NPZ's was chiefly oil from the Ukhtinskoye, Romashkinskoye and other fields, prepared at the fields by the thermochemical method. The salt content in the original oil mixtures equaled 700 to 800 mg/l in 1974 versus 2000 to 2300 in the base year. The improvement in the quality of the preparation of oil at fields has also been conducive to a reduction in losses in preparing oil for refining and in salting water reservoirs.

A positive influence on the reduction of losses has been exerted by the highly even pace in the delivery of crude through the pipeline, which has made possible regularity in the operation of equipment, and by the high level of automation of production because of the use of the unified "Start" system, by separate refining of the trapped petroleum product, and by the organization of precise monitoring and record keeping of the flow of raw material and finished products.

As is obvious from table 1, the reduction in losses in the ELOU in terms of years of operation has occurred at a somewhat slower pace than in a plant as a whole. This is explained by the fact that the major source of losses at the present time is the saline solution, which is discharged from the ELOU into purification equipment. Therefore the introduction of a complex for the process of total evaporation of the saline solution in the ELOU-AVT plant at the Lisichansk NPZ has been of great national economic importance and has made it possible to convert the NPZ's system of purification equipment to a more efficient technology making possible complete recycling of the trapped petroleum products for refining in combined high-unit-capacity oil refining plants of the ELOU-AT and ELOU-AVT type.

As is obvious from table 2, the rate of the reduction of losses in ELOU-AT and ELOU-AVT plants at an index-2 NPZ is considerably lower, and the relative volume of losses in 1974 is 1.5-fold higher as compared with plants at other NPZ's. This is explained by the norms for planned losses for this NPZ, which are higher than at other NPZ's (one percent versus 0.5 percent) as the result of the high unit weight in the composition of the crude of unstable light oil and gas condensate (more than 30 percent). Consequently, the refining of these mixtures is not economical in high-output plants of the ELOU-AT and ELOU-AVT type. For the purpose of carrying out separate refining of the gas condensate and unstable light oil, specialization in plants of lower capacity is required. For example, at an index-1 NPZ refining of the gas condensate is carried out separately in a type 22/4

plant for the secondary refining of benzine, for refining the trapped petroleum product is used freed equipment of the unit for the absorption of thermal cracking benzine, and the unstable light oil is refined in a lower-capacity AVT-1 plant. Therefore losses in ELOU-AT and ELOU-AVT plants at this NPZ are considerably less as compated with other plants of the same type.

In high-output oil refining plants at index-1 and -3 NPZ's, during the period studied, in addition to an increase in capacity of by 19 to 43 percent above the plan, absolute losses were reduced respectively by 0.77 and 0.8 percent, and equaled 0.48 and 0.60 percent in terms of crude in 1974, which is considerably lower than the all-Union planned norms for losses.

A further reduction in losses in high-output oil refining plants at index-2 NPZ's can be achieved by specialization by means of the separate refining of the gas condensate and unstable light oil and by further improvement of the quality of the preparation of oil at oil fields.

Characteristic of the period studied for the operation of plants is the fact that their capacity still did not reach the optimum level enabling maximum profit and economy. This testifies to the fact that in plants there is a potential for improving their capacity, increasing the thoroughness of the extraction of white oils, and reducing losses.

CSO: 1822
8831

UDC 622.691.2-404

ORENBURG SALT DEPOSITS AS AN UNDERGROUND STORAGE MEDIUM

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 11, Nov 79 pp 36-37

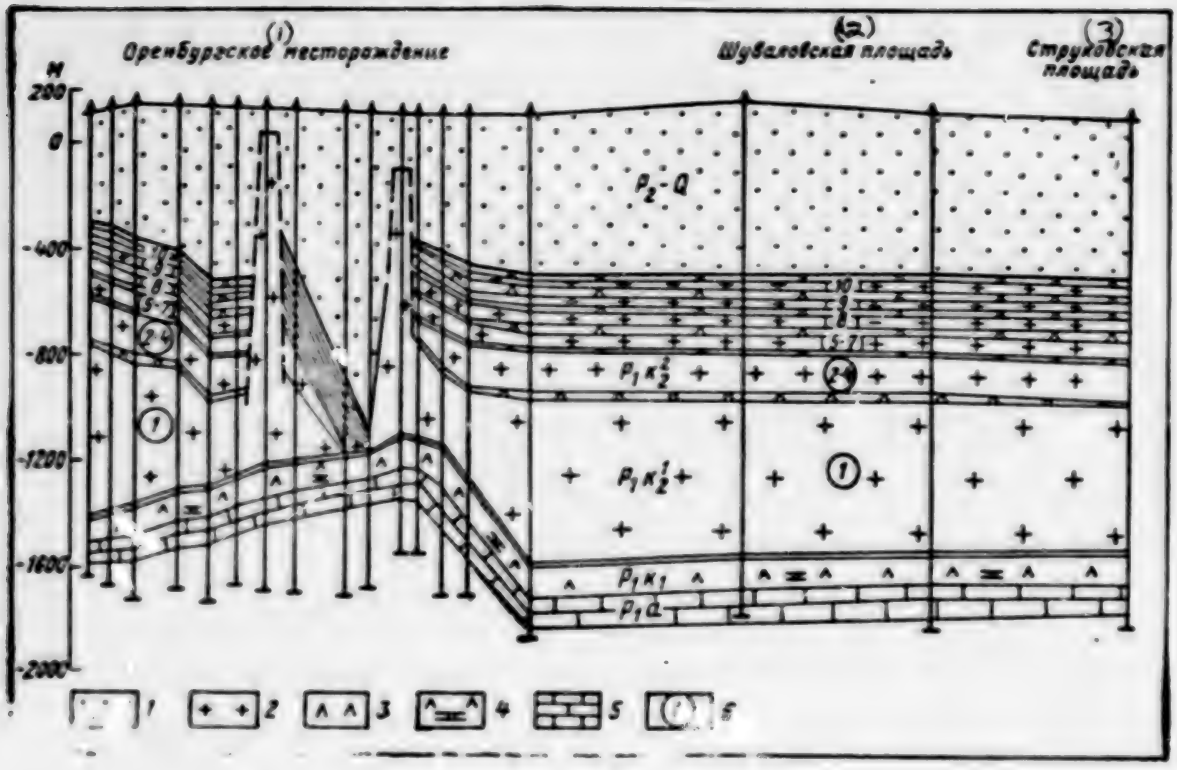
[Article by V. A. Shvets, O. M. Sevast'yanov and L. S. Bondarchuk, Volgo-UralNIPIgaz]

[Text] The characteristic feature of the geological structure of Orenburgskiy Rayon is the presence of salt-dome deposits of considerable thickness, which is very favorable from the viewpoint of creating underground tanks for storage of liquid and liquefied products of the gas and chemical complex.

Solution of the raw hydrocarbon storage problem requires extensive study of the conditions of deposition, chemical composition and physicomechanical properties of salt-bearing rock confined to the Iren'skiy horizon of the Kungurskiy tier of the Lower Permian. These deposits have been penetrated by numerous wells in the Orenburg gas-condensate field on the Kargalinskaya, Syrtovskaya, Strukovskaya and Shuvalovskaya areas.

The profile of the Iren'skiy horizon on the considered territory is represented by alternation of rock salt and anhydrite beds. According to geophysical field data and as a result of study of core material, 7-13 rock salt beds and 8-14 anhydrite beds have been determined.

The first (lower) salt bed, also known under the name halite mass, is the thickest. Its thickness is usually several hundred meters and sometimes increases to 1,200-1,450 meters (see drawing). The rock of the given bed is almost pure halite (sodium chloride), the average content of which is 96.78 percent, while the water-insoluble remainder comprises a total of 0.44 percent (Table 1). A sulfate-salt-bearing mass, in which the salt and anhydrite beds are interstratified with each other, is located above. The thickness of the salt beds in this mass varies from 3-7 to 161 meters and that of the anhydrite beds varies from 2 to 74 meters. A decrease in the thickness of the salt beds from bottom to top along the profile and a corresponding increase of the thickness of the anhydrite beds in this direction are observed.



Schematic Geological Profile of the Orenburg Field, Shuvalovskaya and Strukovskaya Area:
1--sandstones, aleurolites and clays; 2--rock salt; 3--anhydrites; 4--anhydrites with limestone and dolomite streaks; 5--limestones; 6--numbers of rock salt beds. The vertical lines indicate drilled wells.

Key:
1. Orenburg field
2. Shuvalovskaya area
3. Strukovskaya area

The rock salt of the sulfate and salt-bearing mass contains considerable impurities of dolomite, anhydrite and clay material, as a result of which the residue insoluble in water reaches an average of 14.29-19.26 percent for some beds (see Table 1).

Thus, deposits of the halite mass (the first lower salt bed) are more suitable both in thickness and in qualitative composition for creation of underground storage containers.

The indicators of the physicomechanical properties of the salts of the Iren'skiy horizon fluctuate over a rather wide range (Table 2), which is caused by the different content of foreign impurities in them.

Table 1. Average Content of Main Rock Salt Components of the Iren'skiy Horizon of Orenburgskiy Rayon (in percent)

№ пласта соли (1)	(2) Компоненты					Нерастворимый в воде остаток (3)
	NaCl	Ca	Mg	K	SO_4	
7	96,44	0,63	0,06	0,03	1,67	1,43
6	82,11	2,23	0,12	0,09	5,72	8,45
5	90,65	1,08	0,07	0,39	2,81	4,01
4	75,64	2,52	0,06	0,08	6,31	14,29
3	69,69	2,42	0,03	0,03	6,01	19,26
2	74,50	2,33	0,53	1,20	9,13	9,92
1	96,78	0,56	0,02	0,01	1,35	0,44

Key:

1. Number of salt bed
2. Components
3. Water-insoluble residue

The values of density, volumetric mass and strength characteristics of the salts increase with an increase of the clay-dolomite-anhydrite impurities in them. The mean statistical values given in Table 2 characterize the physicomechanical properties of salts of the first bed (the halite mass), which are the most uniform in chemical composition and which contain the least amount of foreign impurities.

The gas saturation of the first salt bed fluctuates from 5.9 to 100.5 cm^3/kg and comprises an average of 64.5 cm^3/kg. Nitrogen predominates in the gas (51.4 cm^3/kg or 79.7 percent) with rather high carbon dioxide content (12.6 cm^3/kg or 19.5 percent).

Other components of the gas are hydrogen and hydrocarbons, the average content of which comprises 0.4 and 0.1 cm^3/kg or 0.6 and 0.2 percent, respectively.

The salt-bearing deposits of the Iren'skiy horizon have low thermal conductivity. According to data of deep temperature measurements in piezometric boreholes, the mean geothermal gradient in the salt mass of Orenburgskiy Rayon is equal to 0.9°C/100 m, while the geothermal stage is 110 m/°C.

The values of these parameters comprise 1.76°C/100 m and 56.9 m/°C, respectively, for the carbonate deposits underlying the salt deposits. The temperature comprises 21-23°C in the roof of the Iren'skiy horizon at depths of 660-990 meters and it is equal to 27-31°C at the bottom at depths of 1,460-1,820 meters.

The technical-economic indicators of construction and operation of underground storage containers are largely determined by the thickness and depths of deposition of the halite mass, which are irregular in the investigated territory (see Figure). They are more stable north of the Orenburg field, where the thickness of the halite mass comprises 420-630 m and the depth of its deposition is 1,050-1,300 m. This vast region is characterized by uniform geological conditions for creation of underground containers.

Large fluctuations of thickness and depth of deposition of the halite mass are noted over comparatively short distances within the gas-bearing profile of the field. The halite mass has a thickness from 560 to 700-800 meters and lies at a depth of 620-1,100 meters on the southern limb of the central folding of the field; its thickness does not exceed 500 m and the depth of deposition comprises 800-1,190 m on the northern limb.

The thickness of the talite mass decreases up to total outcropping from the limbs toward the vault part of the Orenburg arch. There is no halite mass in the two narrow sections extending along the folding axis, one of which has a length of about 17 km and width of 1-2 km and the second of which extends 5-6 km with a width of 0.5-1 km. Moreover, outcropping of the halite mass has been established in the extreme east of the field.

Table 2. Indicators of Physicomechanical Properties of Salts of the Iren'skiy Horizon in Orenburgskiy Rayon (range of fluctuations is given in the numerator and the mean statistical values are given in the denominator)

(1) Плотность, г/см³	(2) Объемная масса, г/см³	(3) Пористость, %	(4) Влажность, %	(5) Пределы прочности, кг/см²			Модуль упругости ($\times 10^5$) кгс/см²	(10) Коэффициент Пуассона
				при одноосном сжатии (6)	при объемном сжатии (7)	при растяжении (8)	(9)	
2,16—2,50 / 2,21	2,12—2,08 / 2,15	0,93—4,8 / 2,7	0,04—0,86 / 0,40	156—396 / 235	456—721 / 565	8—36 / 19	0,41—1,62 / 0,915	0,117—0,381 / 0,260

Key:

1. Density, g/cm^3
2. Volumetric mass, g/cm^3
3. Porosity, percent
4. Moisture content, percent
5. Ultimate strength, kgf/cm^2
6. With one-axial compression
7. With three-dimensional compression
8. With elongation
9. Modulus of elasticity (X 10^5), kgf/cm^2
10. Poisson's coefficient

These sections, comparatively small in area, are not suitable for construction of underground containers. The pre-vault part of the arch is also hardly suitable for this purpose because of the shallow thickness of the halite mass (from several meters to 200-300 meters) with considerable depth of its deposition (950-1,250 m). However, sections of a sharp increase in the thickness of the halite mass, up to 700-800 and 1,200-1,450 m and a decrease of the depth of its deposition to 200-100 m have been determined here. These sections have an elongated shape from 1.5-2 km to 7-8 km long and 0.5-1.5 km wide and one of them, extending toward the southern limb of the Orenburg arch, extends for almost 20 km.

The sections of the uplifted deposit and increased thickness of the halite mass are very promising for creation of underground storage containers.

6521
CSO: 1822

UDC 658.386.003.1

IMPORTANCE OF ECONOMIC EDUCATION OF WORKERS

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 11, Nov 79 pp 4-6

[Article by A. P. Vesel'yev, deputy minister of construction of petroleum and gas industry enterprises of the USSR: "Perfect the Economic Education of the Branch Workers"]

[Text] At the modern stage of communist construction with its high rates of scientific and technical progress economic education of all personnel and the broad masses of workers acquires primary importance.

Economic education is governed by the very life of a society of mature socialism, the requirements for knowing the laws of economic development, the achievements of economic science, and the ability to use economic theory in the process of management.

At the same time economic studies are an organic part of the general system of education of society. Economic education of the workers is a qualitatively new direction in the ideological work, and an efficient resource of education.

The mutual effect of political and economic studies, and their ever increasing role in communist construction convincingly indicate the unsoundness of the approach to economic education of a certain part of the economic leaders as to a short-term campaign that does not have promise.

The modern stage of development of the country's national economy dictates the persistent need for a systematic economic training of the workers.

The tasks of the further perfection of economic education, intensification of its role in improving the efficiency and quality of work were advanced in the decree of the CPSU Central Committee "On Further Improvement in the Ideological, and Political-Educational Work." The value of the economic education of the workers, and in the first place, the builders, especially increases in relation to the imminent transition to a new system of economic work in accordance with the party and government decisions on perfection of the economic mechanism and planning.

Currently the branch employs different forms and methods of economic work.

A lot has been done for a broader involvement of the workers in the system of economic education. According to the model programs in the 1978-79 school year a total of 25% of the overall number of workers of the branch has been instructed. Schools of communist labor (over 1,500), permanent seminars (over 30) for the supervisory link, universities of economics and control in the apparatus of the ministry, in the central boards, associations and certain trusts have been operating.

However, despite the growth in the number of those taught as compared to past years the coverage of the workers by economic studies in the branch is still insufficient. Great nonuniformity has been established in the coverage by studies of the workers in different organizations. Thus, in the Glavkomigazneftestroy about 35% of the workers in the central board were engaged in economic studies, in the Glavneftegazmontazh and in the Glavukrneftegazstroy--21%, and in the Glavneftegazstroymekhanizatsii only 15%. There is an even greater nonuniformity in the coverage by economic studies in the trusts. For example, in the trust Mosgazprovodstroy in 1978-79 school year 74% of the total number of workers were engaged in the system of economic education, and in the trust Tyumengazstroy--only 13%.

At the same time the increase in the number of those taught in the economics schools, seminars, as well as in the schools of communist labor and leading experience acquires exceptionally great importance.

Practice demonstrates that wherever the economic studies have been set up, wherever the leaders constantly control it, there the production indices, as a rule, are also high. Such organizations can include, for example, the association Tatneftestroy, the trust Shchekingazstroy and certain others.

To a considerable degree the weak economic training is the reason for the poor indices of work in the trusts, associations and central boards. Thus, the workers of the apparatus of trust No 1 in the association Soyuzgazpromstroy underestimate the importance of economic knowledge. As a result the production indices in this trust are also low. The Privolzhskgazpromstroy is not the leading in the organization of economic studies and increase in the qualification of specialists. There are claims also for the production and financial indices of its activity.

Shortcomings in the organization of economic work is one of the reasons for the complex financial situation of many organizations and enterprises in the branch.

On the whole, the level of economic work still does not meet the increasing scales and volumes of construction of oil and gas industry facilities, and the complicated economic bonds of the enterprises and organizations.

The collectives of the Ministry of Construction of the Petroleum and Gas Industry Enterprises in the near future are faced with doubling the scales of trunk and field pipeline construction. Such a volume of work can only be successfully fulfilled by means of efficient management.

The task consists of bringing the level of economic work into accordance with the requirements of branch development.

Complexities in the organization of economic studies to a considerable measure are governed by the specific nature of the branch, the large-scale nature of the work with great dispersity of the facilities and subdivisions. The conditions of life, work and studies at the construction sites are difficult. Therefore new forms and methods are required in setting up the educational process.

One can expect perceptible results from economic studies only with planned carrying out of the matter, with the corresponding material and technical, and method support. And this requires long-term and current planning of studies.

Long-term plans of economic training and retraining of personnel, as is known, are compiled for the five-year plan with division into years. Such planning makes it possible to conduct studies with organization, create in advance the necessary conditions for studies, and guarantee continuity and sequence in the enrichment of knowledge.

The level of organization of studies, effectiveness of efforts in this matter of the party, trade union, komsomol organizations, soviets on economic education, and the economic leaders depends a great deal on the quality of the planning.

Planning of economic studies in the association Sibkomplektmontazh deserves attention. Here a detailed complex plan was developed for propaganda of economic knowledge among the workers. The plan defines measures on communication between the soviets on economic education with the matters of the labor collectives of the association, intensification of control over the effectiveness of studies on the part of the party, trade union, komsomol organizations and the economic leaders. Method and publishing work has been planned, and attention is drawn to the study and propaganda of the leading experience, the work with the propagandists. It is expedient to compile such complex plans in each central board, association and trust.

However, in a number of organizations of the branch the importance of long-term planning of economic education is underestimated. Long-term plans are not always corrected, often they do not take into account changes in the programs.

The situation is unfavorable in certain subdivisions also as regards the current planning of economic studies.

Economic studies have a significant effect on the development of socialist competition.

With correct organization of the matter in the process of studies the propagandists help the workers to economically substantiate the socialist commitments. During the studies valuable labor undertakings are born.

Thus, in the studies in the schools of communist labor of the trust Mangyshlakneftegazstroy socialist commitments were examined of the brigade of painters Comrade Chernokalova and brigade of plasterers Comrade Gornostayeva who maintained the initiative "Give work with passport of worker's guarantee." As a result of the discussion of commitments these collectives decided to work under the motto: "Not one lagger near." Over 20 brigades are now working in the trust under such a motto. The leading brigade of plasterers of Comrade Gornostayeva is now working in the account of the 11th Five-Year Plan.

The brigade of pile-drivers of Comrade Antonov from the PSMK-1 of the association Sibkomplektmontazh, all of whose members are auditors in the school of communist labor, has become the initiator of the initiative "Five-year plan in 4.5 years."

Auditors in the school of communist labor, members of the brigade of Comrade Lokhtachev (Sibkomplektmontazh) have adopted the socialist commitment of fulfilling the assignment of the 10th Five-Year Plan by the 110th anniversary of V. I. Lenin's birthday.

It is necessary to strive so that the studies in the system of economic education promote a broader involvement of the workers in socialist competition, and education in creative activity of the branch workers.

Economic education is one of the factors for improving the preparedness of personnel for solving the practical problems in production, in each labor collective.

To intensify the practical directivity of economic education courses have been provided for on spreading the leading experience. In the past school year about 7,000 auditors studied in these courses in the branch. Such courses successfully operated , for example, in the association Tatneftestroy. During the studies over 70 suggestions were received from the auditors, of them over 50 were considered in planning the current production activity.

In the schools of communist labor of the association a study was made, for example, of the experience of working of the excavation complexes led by the Heroes of Socialist Labor Comrades Tyunin and Isayev, as well as those headed by Comrades Popov, Bogayev, Dotsko and others.

In the Glavkomigazneftestroy 23%, and in the Glavsibtruboprovodstroy 18% of all those taught studied the program of the course "leading experience" in the 1978-79 school year.

It is necessary to considerably expand the audience of these courses. It is necessary to increase the attention to study of local, branch and inter-branch experience. Soviets on economic education with the help of the administration must make an analysis and collection of the most valuable leading experience, and prepare the necessary materials for the propagandists and auditors. In the process of studies the auditors should be assisted in economically substantiating the oncoming plans, complex plans for increasing labor productivity, and the quality of the objects put into operation, as well as the individual accounts of saving.

Of great importance is the attentive attitude towards the remarks and suggestions made by the auditors on questions for perfecting the production and economic activity. It is necessary to create at the enterprises and in the organizations special commissions, offices or groups to take into account, analyze, generalize and practically utilize such suggestions. It is necessary for each sensible suggestion directed towards the increase in efficiency and quality of work is to be regarded and realized.

Economic studies promote activation of efficiency experts' and invention activity.

A lot of attention is being focused on this aspect of economic studies by the associations Sibkomplektmontazh, Tatneftestroy, Turkmenneftegazstroy and Glavkomigazneftestroy. In the indicated organizations the soviets on economic education plan expansion of the efficiency experts' work, and note the best efficiency experts. Such work has been set up well in a number of trusts of Glavtyumenneftegazstroy and Glavneftegazstroy [Main Administration for Construction of Gas and Petroleum Extracting Industry Enterprises]. For example, in the trust Tuymazaneftestroy the workers and engineering-technical workers engaged in economic studies made 400 efficiency experts' suggestions with economic effectiveness of [illegible]000 R. In the 1978-79 school year the auditors in the system of e[illegible]ic education of the branch made a total of over 9,000 efficiency e[illegible]' suggestions and over 40 inventions with economic effect over 26 mi[illegible]ion R.

One of the important trends in perfection of the economic education of branch workers is improvement in the organization of studies under route conditions.

Attention should also be paid to the study of the experience of the trust Severtruboprovodstroy on accelerated training on the routes of auditors on a complete educational prog[illegible]am.

Studies are held in enlarged brigades. Here the lecture method is mainly used. The lecturers conduct studies on one topic in several schools.

An increase in the quality and efficiency of economic education to a decisive degree is determined by the composition of propagandists, their knowledge and attitude towards their commitments.

A large team of propagandists, 4,380 people, is working in the branch. Until the end of 1979 in the Institute for Improvement of Qualifications (IPK) of supervisory workers and specialists and its branches 230 propagandists passed training; in the new school year 1000 propagandists will be trained here.

In training the propagandist personnel especial attention should be given to the mastery of the essentials of pedagogy, psychology, oratorial art, increase in the knowledge of problems, paths and methods for perfecting the economic mechanism.

The role of the branch IPK must be increased in generalizing and spreading the experience of work of the best propagandists and school leaders. This experience should be thoroughly studied and made a property of the branch.

It is necessary to involve more widely the economic services of the trusts in the work with propagandists. The soviets on economic education are obliged to clearly and completely provide the propagandists with statistical materials.

The system of economic education of the branch is called upon to play an exceptionally important role in the solution of tasks advanced by the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving the Planning and Intensifying the Effect of the Economic Mechanism on an Improvement in the Efficiency of Production and Quality of Work."

This decree provides for an expansion in the planning periods with formation of long-term plans of economic and social development. Such a solution to the problem of planning will make it possible to more closely correlate the main indices for each specific five-year plan with the next.

A system has been envisaged for developing sections of measures to plan social development. Well set-up work in this area will permit in addition to the main task, solution of a number of such complicated problems as decrease in the turnover of personnel, increase in their professional level, and growth in labor productivity.

It has been established that the growth in labor productivity will be determined according to the pure product or another index that reflects more accurately the changes in the outlays of labor, while the planning of the fund of wages is implemented according to the standard for a ruble

of product, according to the index employed for planning labor productivity, i.e., in the majority according to pure product.

The method of calculating the volume of pure product in the branch organizations will be determined after the development of the corresponding method materials. The volume of pure product can be computed according to the outlays for construction production minus outlays for materials and equipment. Instead of the index of pure product during planning of labor productivity for certain branch organizations such an index can be used as extent (in km) of the constructed pipeline (segment).

A new index in planning of labor is the limit number of workers and employees. Under conditions of a rise in the shortage of labor resources the use of such an index will promote a better balance in the plans.

In the new methods of planning the intermediate payments and issuing of advances to the customer are revoked, and payment for fulfilled work is provided for only for the finished production plants and objects. The outlays of the construction-assembly organizations for incomplete production must be covered mainly by means of their own circulating resources. Fine sanctions are also used for the violation of schedules of putting production plants and objects into operation. The sphere and degree of economic stimulation for the putting into operation of production plants and objects is expanding. The shape of profit formation of the contracting organizations is being altered which will be obtained as the difference between the estimated cost of the finished facilities and the actual expenses of the construction production.

The attitude towards wholesale products is being basically altered. The "wholesale" index remains in the sphere of economic administrative categories. It is not confirmed in the state plan, but is only established for the ministries, departments and union republics by the USSR Gosplan.

Economic computation in construction must receive broad development. There remains a lot to be done in this direction in the subdivisions of the Ministry of Construction of Petroleum and Gas Industry Enterprises.

The transition to construction of objects "in full swing" will have decisive importance in the intensification of the role of the finished product.

The Ministry of Construction of Petroleum and Gas Industry Enterprises has planned the transition in the 11th Five-Year Plan to this method of constructing petroleum product pipelines.

Thus, the tasks which need to be solved by the entire collective of the branch in light of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Intensifying the Effect of the Economic Mechanism on an Improvement in the Efficiency of Production and Quality of Work" are very significant.

The system of mass economic education must become the leader of new ideas and methods of management.

No less than 40-50% of the workers involved in the subdivisions of the ministry must be enlisted in the system of economic education. It is necessary to organize a deep study of the conclusions of the new reform.

Now the main task of economic studies consists of arming each leader, man in charge, foreman, brigade foreman, all the workers and employees with a knowledge and understanding of the problems, paths and methods for a further improvement in economic activity. Studies should be directed towards and conducted for the solution of this task in the system of economic education, and study of the leading experience of increasing the efficiency and quality of work.

Especial attention should be paid to an introduction of efficient forms of instruction in the primary production collectives working under route conditions.

In relation to the reconstruction of the control over the pipeline construction in the branch and organization of new cost accounting central boards their role in conducting economic studies is increasing.

The soviets on economic education jointly with the administration, local party, trade union and komsomol organizations are obliged to raise even higher the level of leadership of the economic studies, determine and plan a set of measures directed towards its further perfection.

The knowledge obtained in the studies in the system of economic education must promote the successful fulfillment by the toilers of the branch of the assignments of the 10th Five-Year Plan, and creation of a solid foundation for the solution of the ever increasing problems of the 11th Five-Year Plan.

9035
CSO: 1822

END

END OF FICHE DATE FILMED

Feb 15, 1980

Jones